U.S. Army Research Institute
for the Behavioral and Social Sciences

Research Report 1752

Operational Assessment of Force XXI Training Products: Lessons for Successful Fielding

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14. ABSTRACT *(Maximum 200 words)*:

This report describes the activities and findings of the capstone assessment of the U.S. Army's Force XXI Training Program (FXXITP). The assessment project was titled, "Implementation and Support for the Assessment of Force XXI Training Program (ISAT)," and focused on the utility of selected FXXITP products in supporting brigade yearly training, specifically in preparation for National Training Center rotations. The ISAT project outcomes represent a compilation of implementation methods, assessment data and analyses, lessons, and recommendations. The project confirmed the importance of maintaining the currency of training products, and of providing both education and implementation support to units who will use the products. Additionally, the project highlighted the importance of creating flexible training products that can be tailored to the needs of the user.

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FOREWORD

The U.S. Army is facing the challenge of meeting complex training requirements with increasingly constrained resources. As a result, Army trainers are exploring emerging technologies and innovative techniques that can be used to achieve training goals. Part of this exploration has been accomplished through the Force XXI Training Program (FXXITP).

The FXXITP was established in 1995 by the U.S. Army Training and Doctrine Command (TRADOC) and is overseen by TRADOC's Directorate of Training and Doctrine Development (DTDD) at Fort Knox, Kentucky. The DTDD has worked with the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) to research and develop numerous training products for the program. The majority of the work was performed at the Armored Forces Research Unit at Fort Knox, with additional work completed at the Infantry Forces Research Unit at Fort Benning, Georgia. The work centered on the development of simulation-based, structured training support packages (TSPs) designed for the collective training of reserve component (RC) and active component (AC) battalion and brigade staffs.

Once the initial FXXITP products had reached a sufficient state of maturity, the TRADOC Deputy Chief of Staff for Training (DCST) directed that these products be assessed while being used by AC brigades. The assessment was to focus on the utility of the TSPs in supporting the brigades' yearly training, specifically in preparation for National Training Center rotations. The ARI was to provide the support for assessment by means of a project entitled *Implementation and Support for the Assessment of Force XXI Training Program (ISAT)*. Along with a team of contractor personnel, ARI conducted the assessment with the assistance of four AC brigades between April 1998 and May 1999.

While the primary focus of the DCST directive was on assessment of FXXITP product utility, ARI directed that the contractor team also support implementation of the products, to ensure that the assessment would take place in a context of full product use. Therefore, the assessment strategy included plans for a support infrastructure that would facilitate integration of the FXXITP products into unit training plans.

The scope of the assessment, as originally planned, was adjusted continually over the course of the project due to external constraints and other demands on the activities of the participating units. As a result, the assessment questions could not be completely addressed. This report discusses the background of the ISAT project and documents project activities and outcomes. The implementation and support history, assessment results, and lessons learned were briefed to the office of the DCST on 21 July 1999. The findings, despite the compromises to scientific

rigor, should support the development and fielding of TSPs that will improve the near-term readiness of the Army's AC and RC forces. Army policy makers and training developers will find this report useful in continuing their efforts to provide usable and affordable training products for units.

ZITA M. SIMUTIS
Technical Director

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OPERATIONAL ASSESSMENT OF FORCE XXI TRAINING PRODUCTS:
LESSONS FOR SUCCESSFUL FIELDING

EXECUTIVE SUMMARY

Research Requirement:

The U.S. Army is facing the challenge of meeting complex training requirements with increasingly constrained resources. As a result, Army trainers are exploring emerging technologies and innovative techniques that can be used to achieve training goals. Part of this exploration has been accomplished through the Force XXI Training Program (FXXITP).

The FXXITP was established in 1995 by the U.S. Army Training and Doctrine Command (TRADOC) and is overseen by TRADOC's Directorate of Training and Doctrine Development (DTDD) at Fort Knox, Kentucky. The DTDD has worked with the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) to research and develop numerous training products for the program. In 1998, the TRADOC Deputy Chief of Staff for Training (DCST) directed that these products be assessed while being used by active component brigades. While the primary focus of the DCST directive was on assessment of FXXITP product utility, ARI directed that the contractor team also support implementation of the products, to ensure that the assessment would take place in a context of full product use. Therefore, the assessment strategy included plans for a support infrastructure that would facilitate integration of the FXXITP products into unit training plans.

The project that was organized to support the DCST directive was titled *Implementation and Support for the Assessment of Force XXI Training Program (ISAT)*. The specific objectives included: (a) to develop a plan to guide the implementation and assessment of selected components of the FXXITP; (b) to build an implementation support infrastructure at participating unit locations to facilitate the assessment; (c) to conduct the implementation and assessment at unit locations and Fort Irwin, California, (the National Training Center [NTC]); and (d) to document the implementation and assessment process, the results of the assessment, required changes to the products, and suggestions for future development.

Procedure:

The project's Execution Plan (Human Resources Research Organization [HumRRO], Raytheon Systems Company, TRW S&ITG, & Litton PRC, 1998c) outlined the project's strategy for accomplishing the objectives. It included plans for managing the project from Fort Knox, and providing support to the two selected user units. Data collection for the assessment would involve interviews, questionnaires, and observations, as outlined in the Assessment Plan (HumRRO et al., 1998a).

In general, the Execution Plan outlined four activities to support the implementation:
- Purchase hardware (computers and associated components) to support use of Battle Staff Training System (BSTS)

- Reproduce and distribute BSTS software and CD-ROMs

- Reproduce and distribute training support packages (TSPs) for vignettes, Brigade Staff Exercise (BSE) and Brigade and Battalion Staff Exercise (BBSE)

- Establish a training infrastructure to include

    - on-site personnel at the user unit sites who would provide train-the-trainer sessions on all FXXITP products and assist with implementation of the BSTS and vignettes,

    - personnel at Fort Benning and Fort Knox who would be available to answer difficult questions about the FXXITP products, and

    - provisions for a surge team assembled on an as-needed basis to travel to the user units and assist with implementation of the BSE and BBSE.

Similarly, the assessment requirement was supported by four activities:

- Observe and document the implementation and assessment processes

- Conduct data collection from participants by means of interviews and questionnaires

- Conduct quantitative and qualitative analyses of the assessment data

- Synthesize findings, lessons learned, and implications for FXXITP future directions.

Because only a limited number of brigades were going to participate in the implementation and assessment, and because there was no opportunity for rigorous control of the brigade activities, the assessment was not meant to be a full evaluation of the products' value or impact. Instead, ARI and DTDD asked for a complete case study of the implementation activities, along with intense efforts to obtain reactions and suggestions from all those involved in the product use.

Findings:

The ISAT project outcomes represent a compilation of implementation methods, assessment data and analyses, lessons, and recommendations, summarized in this report. The lessons address considerations of acceptability, impact, supportability, and training effectiveness assessment itself. Within the lessons, the research proffers solutions to the identified problems. Some of the solutions require additional research, while others will require action at the highest levels of Army leadership. Those solutions that are within the reach of training designers and developers include research on TSP and implementation models, redesign of TSP products and distribution requirements, and planning for maintenance and sustainment of products. Other solutions, including the need for command emphasis at division-level and higher, and the institutionalizing of the products, will require that TRADOC and Army leaders make a commitment to support the development and implementation of such products that may increase readiness without increasing training costs.

Project lessons also indicate the importance of maintaining the currency of training products, and of providing both education and implementation support to units who will use the products. Additionally, the data and comments from users highlight the importance of creating flexible training products that can be tailored to the needs of the user.

Utilization of Findings:

The ISAT project has generated information and lessons that will facilitate the fielding of structured training products. As a continuing emphasis is placed on providing low-resource, cost-effective training for U.S. Army personnel, this report can lead those training development efforts into the selection of purposeful design and implementation initiatives.

OPERATIONAL ASSESSMENT OF FORCE XXI TRAINING PRODUCTS: LESSONS FOR SUCCESSFUL FIELDING

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OPERATIONAL ASSESSMENT OF FORCE XXI TRAINING PRODUCTS: LESSONS FOR SUCCESSFUL FIELDING

Introduction

Since 1995, the Force XXI Training Program (FXXITP) has been laying the groundwork for a systematic program of structured training for the U.S. Army. The research and development products include individual training on staff warfighting skills as well as synchronization skill exercises at the collective level. The methods for training delivery are based on principles of adult training and learning, and incorporate recent technological advances in computer-based instruction and simulation-based training. All of the products are task-linked to doctrinal materials; as a result, a logical training sequence for skill acquisition and practice is inherent across the products, and all products can be identified by unit trainers as supportive of their training needs and objectives

All of the FXXITP products were designed and developed under the sponsorship of the FXXITP and the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI), following the time-honored methods of Instructional Systems Design (ISD), as explicated in the Army's Systems Approach to Training (SAT) (Department of the Army [DA], 1995a). During development, each product was formatively evaluated and revised several times. The training materials were repeatedly subjected to expert reviews by representative users and training developers. The completed materials are constructed as exportable training support packages (TSPs), containing virtually everything the user would need to implement the products.

Yet despite the expertise of those involved in the design and development, the sound instructional foundations, and the intensive formative evaluation processes, none of the products had undergone rigorous summative evaluation. The continuous quality control activities embedded in the design and development process ensured that the materials were complete and correct. But without a monitored product implementation and examination of the effects of product use on staff performance, the issue of training effectiveness was still open.

Recognizing this important gap in the trail of evidence for product acceptability, the Deputy Chief of Staff for Training (DCST) of the U.S. Army Training and Doctrine Command (TRADOC) directed that these products be assessed while being used by active component (AC) brigades. The assessment was to focus on the usefulness of the TSPs in supporting the brigades' yearly training, specifically in preparation for National Training Center (NTC) rotations. Working with the FXXITP, ARI was to provide the support for assessment by means of a project entitled *Implementation and Support for the Assessment of Force XXI Training Program (ISAT)*. Along with a team of contractor personnel, ARI conducted the assessment with the assistance of four brigades between April 1998 and May 1999.

While the primary focus of the DCST directive was on assessment of FXXITP product utility, ARI directed that the contractor team also support implementation of the products, to ensure that the assessment would take place in a context of full product use. Therefore, the assessment strategy included plans for a support infrastructure that would facilitate integration of the FXXITP products into unit training plans.

Purpose and Organization of the Report

This report describes the methods, results, and conclusions of the ISAT project's assessment of the FXXITP products. The report highlights:

- incorporation of the FXXITP products into the units' training plans,

- assessment procedures and results,

- recommended changes to the FXXITP products, and

- recommendations for future training programs.

The report includes six sections:

- Section 1. Project Overview: Describes the FXXITP and the project's technical objectives and approach.

- Section 2. Implementation Plans and Reality: Presents the project's implementation plan, followed by a discussion of how units actually used the products.

- Section 3. Assessment Plans and Reality: Presents the assessment objectives and planned activities, along with a description of the actual data collection activities.

- Section 4. Results and Discussion: Presents project findings related to the critical issues explored during the assessment.

- Section 5. Lessons Learned: Describes the implications of project results as they apply to the use of the FXXITP products in unit training and FXXITP product design.

- Section 6. Conclusions and Recommendations: Discusses the value of the FXXITP products, factors for successful implementation, future directions for the FXXITP, and a strategy for fielding, maintaining, and sustaining the FXXITP products.

Appendix A contains a list of acronyms used in this report.

Section 1. Project Overview

At the start of the ISAT project, ARI outlined the project requirements in terms of technical objectives and operational tasks. These objectives (described below) formed the basis for the project's implementation plans, including its general assessment approach and team organization.

This overview begins by describing the FXXITP products that had been selected for assessment. It then lists the project's objectives and describes the project's approach to performing the stated requirements for implementation and assessment.

The Force XXI Training Program

The FXXITP was established in 1995 by TRADOC and is overseen by TRADOC's Directorate of Training and Doctrine Development (DTDD) at Fort Knox, Kentucky. The DTDD has worked with ARI to research and develop numerous training products for the

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program. The FXXITP was designed to reduce the detrimental impact of restrictions on weapons use during training, terrain limitations, and reduced resources available for attaining training proficiency and readiness. Several products have been developed to assist units by raising their level of task/skill performance, thereby ensuring more effective use of live field-training opportunities. Four of the FXXITP training products were selected to be the focus of the ISAT implementation and assessment:

- Battle Staff Training System (BSTS),

- Brigade Staff Vignettes[1],

- Brigade Staff Exercises (BSE), and

- Brigade and Battalion Staff Exercises (BBSE).

Research and development on the BSTS originated at ARI's Infantry Forces Research Unit (André, Wampler, & Olney, 1997) and continued at the ARI Armored Forces Research Unit (AFRU). Research and development that led to production of the brigade staff vignettes, BSE, and BBSE was conducted by ARI AFRU. The vignettes and the BSE were completed in 1996 (C. H. Campbell, Graves, Deter, & Quinkert, 1998), and the BBSE was completed in 1998 (C. H. Campbell et al., 1999).

The Battle Staff Training System

The BSTS consists of functional area TSPs for individual battalion- and brigade-level staff officers. The TSPs combine computer-based instruction (CBI) and text. Each TSP presents a course of instruction by means of CD-ROM based products and supplemental text-based instruction. Additionally, a training management system (TMS), Environment for MultiMedia interactive instruction (EMMii), allows the trainer or other designated individual in the unit to monitor the progress of individual staff officers as they proceed through the courses. Courses train commanders and staff officers in their individual warfighting skills to enhance their proficiency in synchronization of battlefield operating systems.

The Brigade Staff Vignettes

The brigade staff vignettes are 24 short, self-contained training activities that focus on specific staff process events. These are structured training events in that they provide all the necessary components to implement and conduct meaningful training. Each vignette is designed to provide practice and feedback on explicit objectives and tasks. The TSP for a vignette defines the objectives, outcomes, and limits of the training experience. The structure also includes the tactical scenario that provides the framework for the required activities. Four of the 24 vignettes use constructive simulation (Brigade/Battalion Battle Simulation [BBS] or Janus) to generate scenario events, while the rest use live simulation.

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[1] The vignettes were later renamed Staff Group Exercises by DTDD.

The Brigade Staff Exercise

The BSE components include integrated scenarios covering the preparation, planning, and execution phases of the battle. The BSE scenarios are developed for constructive simulation conducted in the Mojave Desert, including the NTC terrain "box." The TSP for the exercise also contains brigade staff preparation materials and guidance, simulation system electronic files and documentation, instructions for interactors and roleplayers, materials and guidance to support observation and feedback, and complete details for exercise conduct and control. The majority of the work provided from this research effort focuses on the brigade commander and selected staff members. The primary training audience members are shown in Table 1.

Table 1
Primary Training Audience for the Brigade Staff Exercise

Training Audience Member	
• Brigade Commander	• Executive Officer
• Adjutant (S1)	• Intelligence Officer (S2)
• Operations Officer (S3)	• Supply/Logistics Officer (S4)
• Fire Support Officer (FSO)	• Fire Support Coordinator
• Air Defense Artillery Coordinator	• Brigade Engineer
• Army Aviation Liaison Officer	• Chemical Officer
• Military Police Platoon Leader	• Signal Officer
• Forward Support Battalion Commander	• Direct Support Military Intelligence Company Commander

The Brigade and Battalion Staff Exercise

The BBSE is a structured, multiechelon, battlestaff training exercise that encompasses planning, preparation, execution, and sustainment. It allows battalion and brigade commanders and staffs to interact as they plan for tactical missions, employ combat power, and conduct rear area sustainment operations. A training scenario generates an NTC-like operational tempo requiring 24-hour operations and stresses concurrent and parallel planning processes. The exercise allows the unit to practice and receive feedback on key staff procedures, which enable the unit to enter major field training exercises at a higher level of proficiency in the staff process. The BBSE generates the information, cues, and simulated operations that allow combat service support (CSS) to be a major consideration.

The BSE, BBSE, and the four simulation-based vignettes require the support of an established simulation center that can conduct brigade-level exercises using BBS and Janus. The TSPs contain details specific to use of simulation in these particular exercises.

By the time of the ISAT project, each of the four FXXITP products had been formatively evaluated and delivered to the Army. However, analyses to determine the effectiveness of the products upon their integration into unit training strategies had not yet been conducted. Thus, the ISAT assessment focused only selectively on evaluating TSP designs, and more on

evaluating products for their capacity to support unit training plans. The objectives and tasks of the ISAT project were designed to facilitate such an assessment.

Project Objectives

The vision of the project's procedures and outcomes was presented by ARI in terms of four technical objectives:

- To develop a plan to guide the implementation and assessment of selected components of the FXXITP.

- To build an implementation support infrastructure at participating unit locations to facilitate the assessment.

- To conduct the implementation and assessment at unit locations and Fort Irwin, California (the NTC).

- To document the implementation and assessment process, the results of the assessment, required changes to the products, and suggestions for future development.

The ISAT team developed both an execution plan and an assessment plan (HumRRO et al., 1998a, 1998c) that addressed the requirements of the first objective, and then followed the plan to accomplish the second and third objectives. The fourth objective, documentation, is largely met by the production of this report.

The remaining parts of this section briefly describe the activities outlined in the execution plan. Sections 2 and 3 will provide details about the implementation infrastructure and assessment plans.

The ISAT Project Execution and Assessment Approach

The project's Execution Plan (HumRRO et al., 1998c) outlined the project's strategy for accomplishing the objectives. It included plans for managing the project from Fort Knox and providing support to the user units at other locations. Data collection for the assessment would involve interviews, questionnaires, and observations, as outlined in the Assessment Plan (HumRRO et al., 1998a).

In general, the Execution Plan outlined four activities to support the implementation:

- Purchase hardware (personal computers and associated components) to support use of BSTS

- Reproduce and distribute BSTS software and CD-ROMs

- Reproduce and distribute TSPs for vignettes, BSE and BBSE

- Establish a training infrastructure to include

  - on-site personnel at the brigade locations who would provide train-the-trainer (T3) sessions on all FXXITP products, assist with implementation of the BSTS and vignettes, and assist units in understanding and taking advantage of the FXXITP opportunities;

- personnel at Fort Benning and Fort Knox who would be available to answer difficult questions about the FXXITP products; and

- provisions for a surge team assembled on an as-needed basis to travel to the brigade locations to assist with T3 sessions for BSTS and vignettes and implementation of the BSE and BBSE.

Similarly, the assessment requirement was supported by four activities:

- Observe and document the implementation and assessment processes

- Conduct data collection from users and other participants by means of interviews and questionnaires

- Conduct quantitative and qualitative analyses of the assessment data

- Synthesize findings, lessons learned, and implications for FXXITP future directions.

Because only two brigades were going to participate in the implementation and assessment, and because there was no opportunity for rigorous control of the brigade activities, the assessment could not serve as a full evaluation of the products' value, effectiveness, or impact. Instead, ARI and DTDD asked for program monitoring of the implementation activities, with intense efforts to obtain reactions and suggestions from all those involved in the product use.

Details of the plans for implementation are presented in Section 2 of this report, along with a description of how the implementation actually occurred. Section 3 similarly describes the assessment approach and summarizes the extent of the data collection over the course of the project.

Section 2. Implementation Support: Plans and Reality

As a general approach, the ISAT project's assessment focused on the potential success of the FXXITP products in the hands of the users. The basic strategy was to monitor users while they worked with the training products, and to gather feedback regarding suitability, acceptability, training effectiveness, outcomes, and supportability. Focusing on the *impact* of the training products rather than on their *quality* distinguished the ISAT assessment from the established formative evaluation approach used in previous training development research (e.g., C. H. Campbell, Deter, & Quinkert, 1997).

Assessing impact, however, demands either an assumption or an assurance of product use. This facet of assessment is often referred to as a program monitoring or as an accountability study (King, Morris, & Fitz-Gibbon, 1987; Rossi & Freeman, 1993). Accountability studies are frequently the result of external mandates, and focus on one or more aspects of the ways a program is being implemented, as compared to its design characteristics. Program monitoring includes systematic examination of program coverage and (particularly relevant here) delivery.

Because all of the FXXITP products were newly in the hands of users, there was no history of use and no established infrastructure for user support. The user guidance contained in the TSPs had been judged to be sufficient by instructional experts, and the products had been used in

trial implementations. But even in those trial implementations, the development team was on hand to assist with any instances of confusion or inconsistency. After the trials, the materials were revised to eliminate the problems, but there was still no clear evidence that the products were usable by units without further mentoring or assistance. Therefore, ARI directed that the ISAT team assist as necessary to ensure that the products could be used, and monitor all aspects of the attempted implementation.

A distinctive characteristic of this project was that the participating brigades would be preparing for a rotation at the NTC. While the impending NTC rotation greatly increased the potential for direct feedback on the effectiveness of the training as implemented, the schedule for such a train-up is intense. As a result, the FXXITP products would likely compete with events from existing unit strategies routinely used to prepare for NTC rotations. Within the ISAT project, the intent was to work with the units and provide recommendations that would allow the products to complement the units' training strategies. This would leverage use of the training products to better prepare the units to adjust to the faster paced training environment associated with an NTC rotation. The ISAT approach emphasized a high level of support during preparation and conduct of training exercises to increase the likelihood that units would be able to use, and would use, the products being assessed.

Despite the support from the ISAT team, it was anticipated that use of the products could be affected by outside factors such as operational contingency missions (e.g., Intrinsic Action, Team Spirit), weather related disasters, and shortfalls of training funds. These conditions could cause the units to alter the way they used the products. The accommodations required by such disruptions would be instructive from a case study and lessons learned perspective, but it was acknowledged that they could also affect the validity of the program assessment.

As events transpired, expectations regarding the disruptive effects of NTC preparation and other contingencies were borne out. Even as the ISAT project began, unit participation was in a state of flux. This section first describes the effect of external events on unit participation, and then describes the implementation support plan as it existed when unit participation had been decided. The section concludes with a description of the activities and milestones in supporting implementation of the FXXITP products throughout the course of the ISAT project. The description further details the influence of other demands on unit time and planning, especially those demands placed by the impending NTC rotation.

In describing the project's key implementation events, this section focuses on the use of the FXXITP products within the unit training schedules, but also addresses non-FXXITP products and training events that had effects on the assessment results. In addition to providing a history of how effectively the project's implementations would support the assessment purposes and goals, the content of this section will set the stage for project findings and results presented in Section 4.

Unit Participation

As the ISAT project began, TRADOC DCST coordinated with the U.S. Forces Command (FORSCOM) to confirm the tasking of units to support the assessment. The TRADOC DCST

had directed that the assessment be conducted with two brigades within III Corps. The brigades were to be preparing for their NTC rotations as this would best accommodate the long-term ISAT assessment. One of the two brigades initially selected asked to be replaced, citing their then advanced preparation status for their NTC rotation. Another brigade then agreed to participate upon the condition that they would assist in the assessment of only those products that would meet their peculiar training needs. These products included the BSTS and vignettes, but not the BSE and BBSE.

By May 1998, one of the brigades had begun to use the FXXITP materials, as described below. At that time, however, they were told to prepare for deployment. Once this occurred, the brigade could no longer support the ISAT effort. In July 1998, yet another brigade volunteered to participate in the assessment. The participating units, then, included two brigades, one of which would not be using the BSE or the BBSE. A limited amount of use has also occurred in the first, deployed, brigade.

Throughout this report, the three brigades that used the FXXITP products will be referred to as:

- Brigade A—initially selected, deployed after limited use of FXXITP

- Brigade B—could only use BSTS and vignettes in support of its mission and current training requirements

- Brigade C—volunteered later, used most of the products.

Implementation Support Plan

The implementation support activities were scheduled to unfold by way of a planning and preparation phase followed by an execution phase. The timing of the project activities would be linked closely to the training schedules of the two supporting brigades. The schedules of the two brigades were not in any way synchronized and each required a tailored schedule of events supporting product use.

Planning and Preparation

Reports on the development of the FXXITP products have indicated that first-time, and even subsequent, implementations of the products have required a fair amount of implementation support from personnel familiar with the products (André et al., 1997; C. H. Campbell, Graves, et al., 1998; C. H. Campbell et al., 1999; Graves, Campbell, Deter, & Quinkert, 1997; Hoffman, Graves, Koger, Flynn, & Sever, 1995). Although one of this project's critical assessment issues involved investigating the extent to which units could use the products without external support, it was evident that some support would be required to facilitate the assessment. As a result, ARI directed that extensive planning and preparation for product use be conducted. During planning and preparation, the training products would be reproduced and distributed, training support personnel would begin operations, and the user units would receive information and assistance on fitting the products into unit training plans.

Work on this task began as soon as the project officially started. The first activity concerned procurement of hardware to support use of the BSTS. The computer hardware has been chosen to conform to the requirements of the BSTS application, as specified by BSTS developers. In accordance with ARI requirements, 10 multi-media computers were purchased for use in the two brigades: within each brigade, one would be dedicated to brigade staff use, and three would be for the battalion staff. Additionally, two computers would be installed in the installation simulation center at one location for use by other units located there.

A master copy of each TSP (printed materials, electronic data files, map overlays, simulation initialization files, and other materials) was obtained from ARI AFRU as government-furnished materials. The ISAT team reproduced and distributed the materials in sufficient quantity to support the three participating brigades (the two initially selected and the later added brigade) and one installation simulation center (see Table 2).

Table 2
Training Product Components and Quantities

Product/Component	Brigade A	Brigade B	Brigade C	Sim Center	Total
BSTS Multi-Media Computers[a]	4	0	4	2	10
BSTS-Brigade Courseware[b] • CD-ROMs, Student Workbooks, Scenario Orders, Maps, Overlays	1 set	1 set	1 set	1 set	4 sets
BSTS-Battalion Courseware[c] • CD-ROMs, Student Workbooks, Scenario Orders, Maps, Overlays	5 sets[c]	3 sets	6 sets[c]	1 set	15 sets
Vignettes					
• Printed Materials, Scenario Orders, Maps, Overlays	1 set	1 set	1 set	1 set	4 sets
• Simulation Files	–	1 set	–	1 set	2 sets
BSE TSP					
• Printed Materials, Scenario Orders, Maps, Overlays	1 set		1 set	2 sets	4 sets
• Simulation Files	–			2 sets	2 sets
BBSE TSP					
• Printed Materials, Scenario Orders, Maps, Overlays	1 set		1 set	2 sets	4 sets
• Simulation Files	–		–	2 sets	2 sets

Note. [a]Each computer to include required software. [b]For each division, three extra sets of common core courseware per unit set. [c]The distribution to Brigade C was adjusted because of emerging lessons learned from Brigade A use (see text). BSTS = Battle Staff Training System; BSE = Brigade Staff Exercise; TSP = training support package; BBSE = Brigade and Battalion Staff Exercise.

After the first two distributions of materials to Brigades A and B, the team increased the training material to six battalion sets with the three additional common core sets and five additional TMS modules per battalion set. All text material was provided on CD-ROMs. Each battalion set included three additional sets of comprehensive assessment components (COMPS) per battalion. The COMPS overlays were embedded in Acrobat Reader on CD-ROMs, and paper copies of the overlays were also provided.

At the same time, the ISAT infrastructure to support product use was being established. The ISAT project team organization is depicted in Figure 1. The team included training developers and military subject matter experts (SMEs) who had developed the FXXITP. The team was led by a Project Leader who ensured that the project met expected quality standards and presented a complete, coherent, and integrated assessment and results package. The Project Leader was the primary point of contact and communication channel between the ISAT project team and the ARI Contracting Officer's Representative (COR), who interfaced with the DTDD.
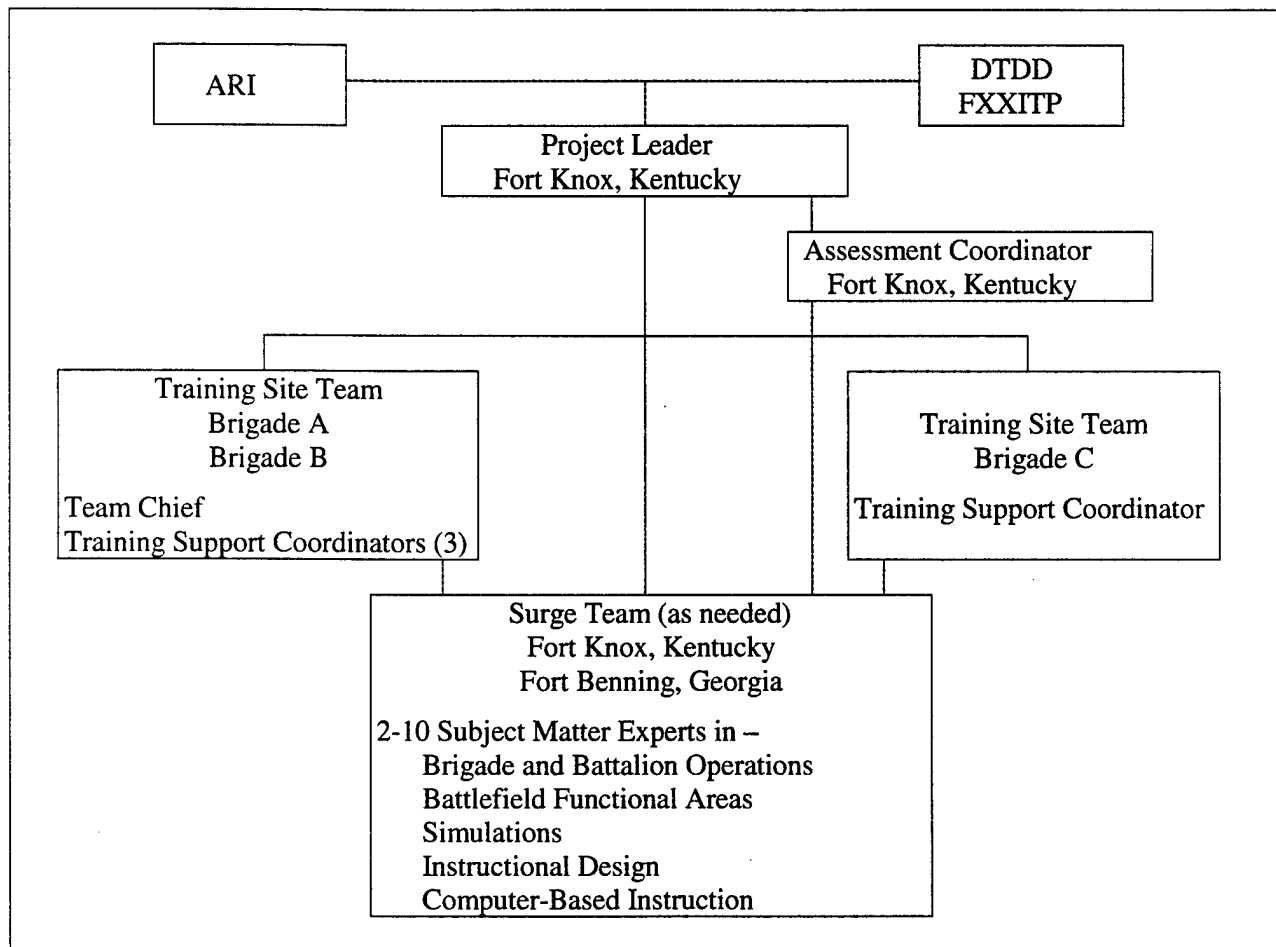
Figure 1. ISAT team organization.

The ISAT Project Leader oversaw the day-to-day functioning of the project staff. Duties included coordinating the implementation and assessment events, preparing intermittent progress reports, tracking internal project scheduling and milestones, and continuous coordination with the participating units. These varied responsibilities and tasks allowed for a well-orchestrated assessment effort under constantly changing operating conditions. Substitutions of participating units and individual unit training requirements continually challenged the project's ability to conduct the assessment in accordance with the project's assessment objectives (described in Section 3 of this report).

Acting under the Project Leader, an Assessment Coordinator developed the project's assessment plan and ensured that all evaluation activities were carried out with careful attention to detail. The Assessment Coordinator coordinated the data collection efforts, analysis, and documentation during product implementation at the brigade locations and during participating unit NTC rotations. Both the Project Leader and Assessment Coordinator were located at Fort Knox, but traveled to implementation sites as required.

The project located a Training Site Team on site for Brigade A and Brigade B. This team included a Team Chief, two Training Support Coordinators (TSCs) for the units participating in the assessment, and a TSC for the simulation center. As product implementations wound down (October 1998), the team at that site was reduced to one person, the Team Chief.

The Team Chief coordinated and directed project activities at the site. He mentored and assisted the units while he oversaw and coordinated the training support for the exercises. He also assisted with the initial orientation training to the corps and division leaders, provided the training for brigade leaders, and directed the training for brigade and battalion training managers. He was directly responsible for carrying out requirements of the assessment plan at that location.

The TSCs supported and coordinated with participating brigades and the simulation centers. Between them, the TSCs represented a skill mix of primary expertise in BSTS, the vignettes and the BSE/BBSE, and the BBS and Janus simulation systems. The TSCs provided training assistance to the participating units, collected assessment data, and provided problem-solving support during the course of the project. These TSCs had the background and experience to establish credibility with the training unit and to assess the training products in a professional manner.

When the requirement to involve Brigade C was approved, the project positioned one TSC there. This TSC mentored and assisted the unit while he oversaw and coordinated training support. He assisted with orientation training to the installation leaders, provided training to the brigade leaders, and directed the training for brigade and battalion training managers. He was directly responsible for carrying out requirements of the assessment plan at that location.

The training site staff members were thoroughly familiar with each of the Force XXI products. Additionally, the contractor team members who developed the products were available by phone and e-mail to solve problems and assist as required.

During the planning and preparation phase, there was an intense proactive involvement with the participating brigades throughout the home-station training cycle. That involvement began with a thorough informational program for leaders, training managers, training support personnel and users of the various products. This orientation was considered essential to proper implementation of the packages and their assessment. With support and general guidance from higher echelons, the ISAT staff then worked with the participating brigade commanders and staff to integrate the products into their long range training calendars. The purpose of these periods of orientation were to ensure that training managers understood the intent, focus, organization, and support requirements associated with the various products and would be able to sequence them in a manner that supported the unit's overall training strategy.

Also during the initial training periods, the ISAT staff briefed the simulation center personnel on the FXXITP products. The simulation center personnel were trained to implement BSTS and monitor vignettes if other units at that location wanted to use them. Because the BSE and BBSE were designed for brigade and battalion exercises based on corps and division orders and overviews, members of the corps staff, the exercise divisions staffs, and the simulation center staffs were to be included in the initial training effort.

The orientation sessions were followed by T3 sessions, provided to the participating brigades prior to their initial use of the FXXITP products. The T3 in preparation for BSTS and vignette implementations were combined into a single session and comprised three days of instruction. The first day of this T3 session focused on BSTS at the user level. During the second day, further training on BSTS was provided to unit BSTS administrators, and unit training coordinators were instructed on the usage and conduct of the vignettes. The third day focused solely on vignette training for the unit staffs.

BSTS training covered the courses available, their general content, time requirements and procedures for using the CBI components, and other topics suggested by the product developers. The training stressed the requirements for recording progress and for completing the comprehensive assessments as laid out in the training management component. Also included was the requirement to provide usage data and feedback on user reactions as part of the assessment effort. Training included sufficient technical information to permit learning center staffs and individual users to properly use the CBI components.

Training on the brigade staff vignettes was designed to be conducted with the leaders and staffs of the participating brigades. The training included an orientation on the materials and how they are organized and presented, and how to determine reproduction, distribution and preparation requirements that must be accomplished prior to the actual training. The role of the TSC in assisting the unit with scheduling, preparing for and conducting the training was also stressed.

The T3 for the BSE and BBSE was modeled after the T3 program incorporated in the BBSE TSP itself. It was preceded by informational sessions for the commanders and brigade staffs and the battle simulation staffs. The information covered the various components that are found in the TSP, how to address the long range planning requirements, reproduction of the guides and TSP components that would be used during a particular exercise, preparation steps for the simulation center, how to determine staffing requirements, arranging for appropriate administrative and tactical communications, selecting command post (CP) arrangements, and conduct of pre-exercise training and preparations. The three-day T3 session itself was decentralized and focused on the following groups:

- unit-provided roleplayers and interactors assigned to the BBS workstations,
- the exercise control (EXCON) cell, which roleplays the higher and adjacent units,
- the opposing force (OPFOR) controller,
- the observers who provide feedback to the training audience, and
- the key training audience personnel.

Unlike the BSTS and vignette T3 sessions, this training was designed to be conducted by the leaders of each of the cells and the simulation center staff, who worked from the materials provided in the TSP. The ISAT team's role during these sessions was to assist the trainers with issues and address concerns with the TSPs.

Execution Phase

During the execution phase, the ISAT team supported the participating brigades using a train-assist-train approach to facilitate the learning process and assist the units in mastering the TSPs and training material. The intent was to allow the units to concentrate on the staff procedures and the military decision-making process and not be encumbered by administrative requirements. While an important aspect of the assessment was "Can the unit set up and use the FXXITP products without assistance?", any value associated with the products could be masked if the units were overwhelmed with the mechanics of setting up and running the exercises. Therefore, it was important to the overall assessment to assist with the logistics of the process and allow the assessment to concentrate on the products themselves and the contribution they may provide to the overall proficiency of the staff. To the extent possible, the ISAT team's assistance was to be transparent to the training units. The team would support the units' training and assist where required or requested on a non-interference basis.

Subsequent to the training described above, the ISAT team continued close coordination with and support of the participating brigades and battalions as they planned for and used the products. The on-site TSCs provided immediate solutions for almost all problems related to FXXITP products. If the on-site TSCs were unable to resolve a problem, they consulted with other experts at Fort Benning and Fort Knox in order to provide a quick response to a support request.

The TSCs provided advice and assistance to the staffs of the units in using the TSPs to select and implement the various options available within the products. They answered questions to help units understand the rationale for particular design features and coached staff officers and soldiers who were assigned responsibility for readying TSP components for particular exercises. The team did *not* actually make the copies and materials which were used during conduct of the exercises. This remains a unit responsibility and an item of interest in the assessment of the thoroughness of the instructions in detailing and supporting unit preparation requirements. Where shortfalls in the instructions were noted or the unit required further explanation, the team took action to ensure that the preparations did not detract from the quality of the training.

When one of the participating brigades prepared to conduct a BSE or BBSE, the TSCs guided the brigades in the selection of missions and scenarios to be trained and assist with coordinating preparation for the event with the simulation center. Just before the BSE or BBSE was actually conducted, a surge team from the Fort Knox ISAT staff would travel to the brigade location to assist with the event. At that time, they monitored and assisted with training for a wide range of participants (e.g., observers, roleplayers portraying enemy and friendly units, and simulation controllers) and assisted with the conduct of the exercise.

The ISAT team's support provided during implementation ranged from low- to high-intensity, depending on the product being implemented. Low-intensity support was provided during BSTS and some vignette implementations, and high-intensity support was provided during any simulation-based training event. During both low- and high-intensity events, the assistance focused on providing advice to the staffs when they had questions or concerns with the TSPs and answering questions about the rationale for a particular design feature. High-intensity support involved the presence of an ISAT surge team and often required that the team guide, to varying extents, the course and conduct of the exercises. Consistent with the project's assessment purposes, all support was documented to be incorporated in assessment findings regarding how well and easily the units were able to conduct the training.

One additional duty of the ISAT team, not anticipated in the execution plan, involved rapid-response training development. The need arose as a result of a requirement for the simulation center supporting brigade to commit their BBS systems in support of a corps-level ramp-up exercise. The simulation center could not conduct the scheduled BSE without the BBS systems, and subsequently, the unit asked the ISAT team to provide a replacement exercise that would provide benefits similar to those of the BSE. The development effort produced a brigade-level, Janus-based, simulation exercise.

Implementation Events

As a general rule, the units implemented the FXXITP training products in progressive fashion, beginning at the individual level. Thus, training began with the BSTS products, then progressed to the vignettes (with some overlap), and (for Brigade C) culminated with the BBSE just prior to their NTC rotation. The units interspersed these events with their own training exercises as they executed their training schedule leading up to the NTC rotation.

Utilization of the Battle Staff Training System

The ISAT team supported and assessed three implementations of the BSTS. Distribution of BSTS TSP materials and equipment to the units was conducted in accordance with the Modified ISAT Execution Plan (HumRRO et al., 1998d) as described earlier (Table 2). Each implementation was different, as described below.

Brigade A established a brigade learning center with their multi-media computers and the TMS computer provided by the project, and configured the BSTS computers in a local area network (LAN). The unit also allowed the installation of BSTS software on unit-owned and personal computers in a stand-alone configuration. When the brigade deployed, the TMS computer was returned to the ISAT team. Brigade B, which was not provided any computers, installed the BSTS into unit-owned and personal computers in a stand-alone mode. They provided usage data to the ISAT team who managed the TMS data input using the computer initially provided to Brigade A.

The two computers provided to the simulation center were configured in a stand-alone mode. Similarly to Brigade A, Brigade C established a brigade learning center with the four multi-media computers and the TMS computer provided by the project. However, they

configured the BSTS computers in the stand-alone configuration due to lessons learned in earlier installations. Brigade C also allowed the installation of BSTS software on unit-owned and personal computers in a stand-alone configuration.

A BSTS T3 session was provided to Brigade A and Brigade C prior to initial use of the BSTS courses. For both participating brigades, ISAT team members presented BSTS user and trainer orientation sessions at the training site. Brigade B elected not to receive formal T3 training, stating that BSTS was supposed to be exportable and should not require T3 training.

In the initial implementation in Brigade A, the brigade and task force staffs chose to bypass the BSTS familiarization instruction provided by ISAT surge team as part of the T3, and only the brigade staff elected to receive the orientation session. As a result, the officers began with an incomplete understanding of the system and many of them encountered technical problems related to installing and/or operating the BSTS software. Especially common were apparent system failures surrounding the manual transfer of test scores from stand-alone computers to the TMS mounted on a central server. The attendant loss of data in the TMS gave the students credit for fewer lessons than they had actually completed. These "failures" were consistently due to users following improper procedures, but nevertheless generated a great deal of frustration. The on-site Training Site Team fielded numerous questions and problems, provided extensive diagnostic and trouble-shooting services, and educated the users about system capabilities and limitations.

At both brigade and battalion echelons within Brigade A, the participating units had insufficient numbers of multimedia computers capable of running BSTS software. Frequently this led officers to use their privately owned computers in order to meet established deadlines. In this assessment, the tasking of staff officers to complete their BSTS courses was by necessity synchronized very tightly, rather than distributed over time. Additional quantities of individual course materials (CD-ROMs, workbooks, maps, overlays, and references) were distributed to units after start-up to support simultaneous use by multiple students.

Because of limited networking capabilities and substantial use of privately-owned computers, many individuals used BSTS courseware in stand-alone mode. This led to bottlenecks due to shortages of CD-ROMs, especially the Brigade and Battalion Common Core course CD-ROMs and EMMii CD-ROMs (normally two per set). Some units were able to create their own copies of the CD-ROMs. The stand-alone environment also required students to upload performance data to the TMS manually by means of floppy diskettes, demanding additional time and effort and engendering resistance.

Based on preliminary feedback from the BSTS implementation in Brigade A and Brigade B, the ISAT team was able to make several improvements as they prepared for implementation for Brigade C (see Table 3). These improvements centered on expanding the quantities of key course materials and making tactical graphics readily accessible. Some of them had been implemented informally during the earlier phase of the assessment. The changes had a positive influence on the BSTS implementation environment at Brigade C and the quality of the subsequent assessment data.

Table 3

Summary of Battle Staff Training System Distribution Changes for Brigade C

Category	Brigade Solution
Problem	
Basis of Issue	
Issuing one brigade set and three battalion sets to a brigade created bottlenecks when staff assistants were tasked to complete courses.	Issuing six battalion sets to the brigade enabled all maneuver and support battalions to work on courses at the same time.
Issuing one EMMii CD-ROM with each brigade or battalion set created bottlenecks when several students in a unit tried to load software on unit-owned or student-owned computers at once.	Issuing three EMMii CD-ROMs with each brigade or battalion set enabled more staff officers to load system software without delay.
Issuing one brigade and one battalion COMPS CD-ROM to a participating brigade created bottlenecks when several students were ready to take the COMPS at the same echelon.	Issuing three COMPS CD-ROMs with each set of courseware enabled more students to take the end-of-course comprehensive exam at the same time.
Accessibility of Overlays	
Providing COMPS overlays only in Adobe Acrobat™ format caused delays when some students had to locate a copy of Adobe Acrobat Reader™.	Providing a copy of Adobe Acrobat Reader™ shareware on each student CD-ROM enabled immediate viewing of overlays.
Printing electronic overlays to obtain hardcopies led to "cut-and-paste" assembly when plotters were not available.	Including a full-size paper copy of each COMPS overlay in each set of courseware made it easier for unit personnel to reproduce overlays.

Note. EMMii = Environment for MultiMedia interactive instruction; COMPS = comprehensive assessment component.

In preparation for implementation within Brigade B, the higher-echelon commander published a directive that all brigade and maneuver task force staff officers complete their position-specific courses within a four-week calendar window. In response, the majority of the brigade staff and part of one task force staff made an effort to devote time to their respective courses. Because the directive suggested that the Brigade and Battalion Common Core courses were optional, all but one of the officers began with their appropriate position-specific course. Time pressures caused many of the students to use a shortcut technique that involved repeatedly taking the subject pre-test until they achieved a passing score. This saved them the time of working through each lesson within the subject. However, it subverted the course's training objectives and undoubtedly imparted a distorted view of the value of the training products. In addition, lack of clear expectations about the end-of-course COMPS led to no one attempting this component of BSTS. The combined pressures and constraints were sufficiently great that fewer than half of the target audience completed[2] the actual lessons within the designated time

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[2] In light of the approach of attacking a course by repeatedly taking the pre-test, "completion" is probably not the appropriate term.

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limit. At the end of the calendar window, competing demands forced the officers to turn their attention to more pressing requirements.

The commander of Brigade C issued instructions that all brigade headquarters, maneuver task forces, and support battalion staff officers should complete the Common Core course plus their position-specific courses, with no time limit specified. This unit followed the TSP-specified execution procedures fairly closely, to include the orientation and familiarization training at the outset. The first personnel in this unit began their course work immediately after the BSTS T3 session, approximately two months prior to the Leader Training Program (LTP) visit to the NTC, and BSTS work within the unit continued until two months or so prior to the scheduled NTC rotation. One task force capitalized on a one-week Simulation Networking (SIMNET) training visit to Fort Knox by having available staff officers work on their BSTS courses between collective training events. One staff officer in this group chose to work through his course with several of his staff members participating throughout. Another group also used the BSTS courseware for staff section training during the T3 period. By the end of the assessment, nearly two-thirds of the target audience had completed their courses. Unfortunately, the manual system for transferring data from the stand-alone computers to the TMS captured only partial information on pre-test and post-test exam scores, COMPS scores, and time taken to complete the various courses.

The task force that spent time on BSTS course work during a Fort Knox visit for SIMNET training provided some interesting insights into the time required to complete the various courses. Four officers were able to complete the Battalion Common Core Course in 2-4 hours. Three other officers completed their position-specific courses in 5-6 hours, which included no reading of reference materials. These times were substantially less than those indicated in the course materials, perhaps reflecting the benefits of concentrating study efforts in a one-day session. This finding suggests that previous estimates of required time may be high, and reliable data in the operational setting might be worth obtaining.

Utilization of the Vignettes

Vignette TSP materials were distributed to each of the brigades and the simulation centers as described earlier and shown in Table 2. The simulation tapes and printed materials from the support coordinator guides for the simulation-based vignettes were provided to the simulation centers because they are responsible for providing simulation support to brigades on their installations. The brigades were expected to ensure that sufficient copies of the vignette materials were made prior to the execution of each vignette.

Vignette T3 training was provided to Brigade A and Brigade C during the same week that the units received their BSTS T3 training. For both of these brigades, the vignette T3 training also included the execution of one vignette. Brigade B did not receive any T3 training, because they wanted to validate the exportability of the vignette materials as they did with the BSTS materials. Similar to their experience with the BSTS, they found it somewhat difficult to execute the vignettes without prior training. However, part of the problem with the vignettes was caused because they made significant changes to the vignettes to bring the scenarios in line with other training they were involved with (described below).

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Brigade B conducted three vignettes in the same week, as part of a staff orders drill in preparation for an upcoming Army experiment. The first two vignettes—Develop a Reconnaissance and Surveillance Plan, and Develop a Service Support Concept—were done simultaneously, with no direct interaction between the two staff groups except during the end-of-exercise briefing to the executive officer (XO). The brigade staff modified the vignette materials by using the tactical materials they had developed for the experiment. Little, if any, consideration was given to how to integrate these materials into the vignettes, and how to use the remaining components of the vignettes. The unit also altered the training audience substantially, expanding the participant group for the reconnaissance and surveillance (R&S) Plan and substituting the Medical Planning Officer for the S1 in the Service Support Concept vignette. The third vignette—Conduct a Brigade Rehearsal—departed from the TSP-specified procedures as well, with staff captains playing the roles of the task force commanders and the event ending prematurely because of administrative considerations. For none of these three vignettes did the staff hold preparation sessions, a situation brief, or an after action review (AAR). In short, the staff of this unit used the selected vignettes as expedients to prepare for a larger simulation-based exercise, and they followed the TSP-specified procedures very loosely.

Brigade C conducted two vignettes—Conduct Mission Analysis and Conduct Course of Action (COA) Analysis—as part of their preparation for the LTP. Three weeks intervened between the two events. An orientation briefing and preparation workshop preceded the first vignette, but no administrative briefing or situation brief occurred for either event. The brigade made maximum use of an expanded training audience that included most assistant staff officers, although no staff noncommissioned officers (NCOs) were present. Without an administrative briefing, there was confusion among some "extra" participants as to the nature of the training. Several of these participants apparently expected they were attending a class as opposed to a practical exercise. No Training Coordinator was designated for either of these vignettes, so no structured observation of the staff processes occurred and the AAR was omitted. The staff appeared to focus more on the end product than on the process and the interaction required to achieve the product. However, the XO used the end-of-exercise briefing to instruct the participants on the commander's expectations and critical elements of information. In summary, the staff of Brigade C used two vignettes as part of their deliberate strategy to prepare for the LTP. While they did not follow all of the TSP-specified procedures, they followed them more closely than did their counterparts in Brigade B.

The vignettes conducted by the brigades were all live vignettes, which minimized the support requirements. The brigades were able to execute each of the vignettes in their command posts or in their brigade learning centers. The biggest support problem encountered was the inability of the brigades to secure the Defense Mapping Agency (DMA)-series maps required for the vignettes. The Fort Knox ISAT team provided one set of maps needed for the vignettes conducted to the unit-located ISAT offices. With the help of the brigades, additional copies of the DMA-series maps were made to meet the training requirements of each vignette conducted.

<u>Utilization of the Brigade Staff Exercise and the Janus Simulation Exercise</u>

An 11th hour decision to commit installation BBS assets to III Corps for a high-priority exercise left Brigade C unable to conduct the BSE as planned. In lieu of the BSE, the unit

implemented a "skeletal" Janus simulation exercise (SIMEX) developed on short notice by an ISAT surge team working at Fort Knox. Centering on brigade operations, the skeletal TSP was a hybrid package resulting from the merging of three vignettes. Because of the lack of time to develop a complete TSP, it was decided that an ISAT surge team would fill roles as EXCON and OPFOR support for the exercise. Janus simulation training and control was provided by staff from the Fort Knox Simulation Center, along with ISAT simulations experts. As a result, the team designed and developed only those TSP components needed by the training audience (e.g., division operation order [OPORD]) and the minimal materials that the surge team would need.

A principal component of the "skeletal" TSP was the Performance Objectives (POs) that came from the BBSE TSP, used to facilitate AAR discussions for the Janus SIMEX. As Brigade C prepared for the brigade operations-focused Janus SIMEX, the commander selected five PO topics to serve as the training objectives for the exercise:

- Reconnaissance operations
- Parallel planning
- Information management
- Integration of fires
- Accelerated decision-making.

Thus, the Janus SIMEX provided an opportunity to assess some of the POs as well as the performance contributions of the training already accomplished with the BSTS courses and vignettes.

The biggest challenge that faced the surge team as they developed the TSP was providing read-ahead materials for the brigade before the TSP was completed. The initial thought was that the Janus SIMEX would be a mix of the "Accelerated Decision-Making Process," "Conduct Parallel Planning," and the "Prepare and Execute a Fragmentary Order" vignettes and that the brigade could use the read-ahead materials from these vignettes to prepare for the exercise. Once the team started to combine these vignettes, however, they realized that trying to pull the correct information from the three vignettes was too confusing, so they developed a separate read-ahead packet for the Janus SIMEX. However, despite efforts to eliminate any confusion by creating a new set of read-ahead materials, they found that the original read-ahead materials for the three vignettes were also distributed, which led to some frustration for the brigade staff members.

For the Janus SIMEX, Brigade C executed 24 hours of mission planning, preparation, and execution across two days, preceded by a day of Janus training for roleplayers and interactors as well as setup of tactical operations center (TOC) and communications equipment. The ISAT effort provided a 10-person surge team, supplemented by three Janus simulation support personnel from the Fort Knox Battle Simulation Center (BSC). The surge team was responsible for controlling the exercise, role-playing the higher and adjacent headquarters and providing simulation system support.

No observers supported the Janus SIMEX exercise, contrary to the TSP instructions. The training audience used the selected POs primarily as a job aid or reference, focusing more on a

monitor-plan-direct process briefed by the commander at the start of the exercise. Ad hoc AAR sessions were conducted daily by the XO, who also led a capstone AAR on the last day of the exercise. The surge team assisted with collection of AAR data. After the exercise was completed the team monitored and recorded the findings during the brigade's final AAR. Two weeks after the Janus SIMEX, the surge team provided the brigade with a tool that identified the vignettes and BBSE POs that would help them correct the problems noted during the AAR.

Utilization of the Brigade and Battalion Staff Exercise

BBSE materials were provided to the simulation centers between March and July of 1998 in accordance with the modified execution plan described earlier (HumRRO et al., 1998d). The simulation tapes and supporting simulation files provided for Brigade C were later updated to the latest version of BBS (version 5.1.1) in October 1998, prior to the conduct of the BBSE train-up in December 1998 and the exercise in January 1999.

Brigade C conducted the BBSE mid-way between their LTP visit and their NTC rotation. The commander retained the same five POs selected for the Janus SIMEX. Because of commitments to subsequent training activities, the unit created a split schedule around the Christmas holidays. Train-up and initial mission planning for the BBSE occurred during three days before the holiday period began. The first mission execution and remainder of the BBSE was conducted shortly after the New Year.

Several elements external to Brigade C supported the preparation and execution of the BBSE. The division headquarters provided the Exercise Director and personnel to staff the division response cell (EXCON). A sister brigade provided the observers, including the Senior Observer/Assistant Exercise Director, and a control cell, including the Blue Forces (BLUFOR) Controller. The installation's simulation center provided BBS support personnel as well as coordination and preparation support for the exercise. Members of the ISAT team provided substantive support during the train-up, but served only as data collectors and advisors during the BBSE itself.

Prior to conduct of the BBSE, the installation held three separate training sessions, for simulation support personnel, EXCON personnel, and observers. The BBS simulation train-up was conducted over three days per the recommendation of the BBSE TSP. The EXCON train-up lasted about four hours, mainly consisting of an organization meeting where the cell leader made assignments, distributed materials and established a time for the key personnel to meet again. Ideally, the EXCON cell would have met for two to three days and reviewed the first and second mission orders and the first mission key messages. The observer train-up was conducted over a two-day period. The first day was devoted to a briefing about the FXXITP in general followed by a detailed briefing about BBSE performance objectives materials, specifically, the five performance objectives being used for the January BBSE. The ISAT surge team provided one person to each training session for support and observation.

The brigade staff started planning for their first mission while the train-up was underway. One ISAT surge team member was on hand to observe the brigade's mission planning effort. The main exercise itself lasted four days, during which the unit maintained continuous (24-hour)

operations. On the first day, the brigade, maneuver task forces, and support battalions tactically deployed their respective CPs and set up the BBS cells while the simulation center personnel conducted BBS refresher training for the BBS interactors and roleplayers. The observers/ controllers evaluated the performance of brigade- and battalion-level elements and conducted daily AARs and NTC-like change-of-mission AARs. The Exercise Director conducted twice-daily exercise control meetings to coordinate the efforts of the EXCON, OPFOR, simulation controllers, and observer/controllers to ensure the brigade's training objectives were being met. On the day after the exercise ended, the Exercise Director led a capstone AAR.

The National Training Center Leader Training Program

The FORSCOM Regulation 350-50-1 (Department of the Army [DA], 1995b) defines the LTP program as "a command and staff training program designed to prepare a unit for a rotation." Consistent with that guidance, the Brigade C commander, his staff, and subordinate commanders viewed the LTP as a rehearsal opportunity in preparation for their April NTC rotation. Their LTP included ground reconnaissance and a constructive simulation exercise with AARs, as well as classroom instruction.

A two-person surge team followed Brigade C to Fort Irwin during their LTP visit in November 1998. The purpose of the surge team trip was to solicit feedback from the brigade and LTP staff regarding the use of FXXITP products to prepare the brigade for the LTP visit and to identify additional training needs of the brigade that can be supported by FXXITP products. Additionally, the team was prepared to provide the LTP and NTC staffs with a briefing to give them a better understanding of the FXXITP products and their potential use.

The National Training Center Rotation

The Brigade C NTC rotation was based on a deployment scenario, and began with one week of reception, staging, onward movement, and integration (RSOI) training. The exercises began with force-on-force missions that pitted the brigade, as a divisional supporting effort, against the NTC OPFOR. The first mission was a movement-to-contact, followed by a deliberate attack, a defense, and a final force-on-force deliberate attack. Following the force-on-force operation the brigade conducted four days of live fire operations. Live fire, like force-on-force, included AARs conducted by NTC observers for the brigade and its subordinate units. Following live fire, the brigade conducted recovery operations.

The surge team for the NTC rotation included six members of the project staff. Surge team members observed most aspects of the brigade's NTC experience, including the RSOI and their 24-hour operations on all three missions. The surge team members were able to talk with the NTC observers and the brigade staff members during lulls in the action.

Summary

This section has presented a description of the planned implementation support activities for the FXXITP products within two brigades, as well as a summary of the actual implementation that took place. The difference between the plan and the reality is important in interpreting the

data collection results. No blame can be attached to any units in their degree of participation, but the fact remains that the implementation and assessment were compromised by the shortfall.

Section 3. Assessment Methods: Plans and Reality

As discussed in the Introduction, the ISAT project was a response to a TRADOC DCST request for empirical data related to the implementation of specific FXXITP products among FORSCOM brigades. At the same time, the project represented an important milestone for ARI's training development efforts. As the first assessment of the FXXITP training products in a routine operating environment, the effort provided an opportunity to gather valuable data regarding expected performance improvement, TSP usability, value realized by tactical units, and implementation requirements. The assessment was to serve four primary purposes:

- Support the decision needs of the DCST regarding fielding of the selected training products.

- Support the limited Training Effectiveness Analysis being conducted by the DTDD, U.S. Army Armor Center (USAARMC).

- Provide the culminating assessment of ARI AFRU's research and development efforts on brigade and below staff training.

- Capture information about how the FXXITP products should be modified and expanded for future use.

Assessment Plan

The Assessment Plan (HumRRO, 1998a) outlined a series of assessment activities that supplemented the project's execution plan (HumRRO et al., 1998c). The assessment activities concentrated on determining the effectiveness and supportability of the selected products as they were integrated into unit training programs and included the following:

- Collect and organize data related to the training effectiveness and implementation requirements of the FXXITP training products.

- Analyze and interpret the accumulated data to support defensible conclusions and recommendations.

- Provide an audit trail documenting assessment methods, including units' utilization and management of the TSP-supported training.

- Identify requirements and suggestions for improving and expanding the FXXITP training products in support of future training needs, especially in light of battlefield digitization.

- Capture lessons learned regarding implementation and utilization of the training products.

For the ISAT assessment, the critical issues initially took the form of five levels of inquiry, with each level building on the preceding level in a progressive fashion. Four of these levels originated with Kirkpatrick (1994): reaction, learning, behavior, and results. The fifth issue—implementation—was added to account for questions relating to potential fielding decisions and

future development efforts, and followed the model of a program monitoring type of evaluation (Rossi & Freeman, 1993). The ISAT team defined each level in terms appropriate to the brigade's training environment:

- Level 1, Reaction—To what extent does the training audience accept and value the FXXITP training products?

- Level 2, Learning—What does the training audience learn, with reference to achievement of training objectives specified in the FXXITP TSPs?

- Level 3, Job Performance—How does use of the FXXITP training products impact individual and collective job performance?

- Level 4, Organizational Impact—How does use of the FXXITP training products affect overall achievement of unit objectives and use of resources?

- Level 5, Implementation—What are the requirements for successful fielding of the FXXITP training products?

A rigorous evaluation according to the structure of the four Kirkpatrick levels (1994) was known at the outset to be a difficult task. Level 1 data are relatively easy to collect, consisting of user reactions that can be obtained by means of questionnaires and interviews, and Level 5 data can be derived from observations as well. However, the Level 2, Level 3, and Level 4 evaluations would require some control of participant activities, and would be strengthened by use of control groups. Furthermore, criterion data would be required on the attainment of training objectives, successful job performance, and institutional impact. Finally, data on only two or three brigades would not constitute particularly strong evidence of the effects of the use of the FXXITP products.

These concerns are not unique to the ISAT assessment, nor to military research work. Rossi and Freeman (1993) stress the need for evaluators to be responsive to the context in which they work, especially regarding the balance between the press for evaluations to be both "scientific" and "pragmatic." As pointed out in Raizen and Rossi (1981), monitoring information is often as important as information on a program's impact. Stake (1979) emphasizes letting evaluation emerge from program observation, and would encourage letting program stakeholders influence the purpose and conduct of the evaluation. Even within the constraints of the formative-summative evaluation discussion, evaluations will vary according to their purposes (Shadish, Cook, & Leviton, 1991). Thus, from the outset, the ISAT assessment team was aware of the challenges confronting the effort, but was also comforted by the fact that the wider program evaluation community had already confronted the same challenges and agreed that program monitoring could yield information as useful as could rigorous impact measurement.

The discussion in Patton (1987) led the ISAT team to the conclusion that a qualitative approach was more appropriate in the assessment of FXXITP product implementation and use. Patton states that "[q]ualitative methods permit the evaluator to study selected issues, cases, or events in depth and detail; the fact that data collection is not constrained by predetermined categories of analysis constitutes to the depth and detail of qualitative data... Qualitative data provide depth and detail through direct quotation and careful description of program situations, events, people, interactions, and observed behaviors" (p. 9).

Therefore, the Kirkpatrick levels (1994) were used to organize the areas of inquiry, but were not strictly used for a full evaluation. The ISAT team determined that data collection among training audience members and other support personnel would be possible, using questionnaires and interviews. In order to focus the questions, the team used the issues connected with the four levels to focus the collection of participant reactions. The data would address perceptions of learning, job performance, and organizational impact (Levels 2, 3, and 4 topics), but would not include direct or objective measures. The questionnaire and interview data would be complemented by thorough documentation of what happened and what could have been done better. In this way, the assessment would resemble more of a case study than a training evaluation.

The restructured assessment framework aligned the original five factors—reaction, learning, job performance, organizational impact, and implementation—into three main areas of interest:

- Acceptability (incorporating most of the data formerly classified under reaction)—Were the training materials doctrinally correct? Were they usable? Were other materials necessary?

- Perceptions of Impact (including issues of learning, job performance, and organizational impact)—Were the training products useful for learning and practicing job requirements and preparing for other major training events? Did users think that the training had (or would have) a positive effect on performance?

- Supportability (covering the questions under implementation)—What would it take to make the training products useable within a brigade's training plan?

The Program Evaluation Standards (Joint Committee on Standards for Educational Evaluation, 1994) delineates 30 standards categorized in four groups corresponding to four attributes of sound and fair program evaluation: utility, feasibility, propriety, and accuracy. Utility standards guide evaluations so that they will be informative, timely, and influential, and require familiarity with the evaluation audience and its information needs. Feasibility standards help to ensure that the evaluation design is operable in a field setting and does not consume inordinate resources. Propriety standards promote sensitivity to privacy, freedom of information, and the protection of human subjects. Finally, accuracy standards help to ensure that the evaluation is comprehensive, the obtained information is technically adequate, and the judgments rendered are linked logically to the data. These were the standards that guided the ISAT assessment.

Data Requirements

The ISAT team began the process of identifying data requirements by developing a comprehensive list of questions of interest, based on the five critical issues (which were restructured later in the project). To ensure that the issues and questions important to the primary stakeholders were addressed, the COR, representatives of DTDD and the USAARMC, and the developers of the products being assessed were asked to contribute questions pertaining to the critical issues and categories of information. Table 4 lists the critical issues, along with the categories of information forming the framework for questions of interest. The resulting list of

questions of interest appears in Appendix B. The questions of interest shaped the development of the project's core set of data requirements.

Table 4
Framework for Questions of Interest

Critical Issue	Categories of Information
Reaction–Acceptance by the training audience	• Credibility • Ease of use • Form and function • Program value • Potential enhancements
Learning–Achievement of training objectives	• Suitability of training objectives • Training effectiveness • Potential enhancements
Job Performance–Impact on individual and collective job performance	• Job relevance • Impact on staff competence • Impact on staff performance • Potential enhancements
Organizational Impact–Impact on overall achievement of organizational objectives and resources	• Relevance to unit goals and requirements • Cost-benefit considerations • Potential enhancements
Implementation–Utilization, implementation and support issues	• Training management and product utilization • Compliance with training support package procedures • Support requirements • Implementation considerations • Lessons learned

Data Collection Instruments

The ISAT assessment was designed to incorporate a wide range of data collection techniques—user ratings, written and oral comments, observations, and descriptive documentation. In addition to constructing the instruments that would support the integration of these techniques, the ISAT team also developed instrument-specific data collection procedures and a plan for analyzing the data.

The primary data collection instruments included questionnaires, structured interview guides, observation guides, a significant events log, and a lessons learned guide. While the questionnaires, interview guides, and observation guides were tailored to each product and/or product implementation, the events log and lessons learned guide were designed to apply across products and implementations. Table 5 describes briefly each type of instrument.

Table 5
Types of Data Collection Instruments

Data Collection Instrument	Summary Description
Questionnaires	Rating scale and open-ended items designed to assess the success of each product in meeting user and organizational needs.
Observation Guides	List of focus issues to structure and refresh monitoring and recording activities of on-site observers.
Structured Interview Guides	Open-ended questions to help ISAT interviewers elicit verbal feedback on the major products and their training value.
Significant Events Log	Checklist and open-ended items used by trained observers to capture and describe significant events.
Lessons Learned Guide	Instructions and checklist used by ISAT Team members to capture insights and "next time" suggestions.

For the assessment of each FXXITP product, design and development of data collection instruments began with a review of the core questions of interest to select those directly relevant to the product and its intended utilization. The team synthesized the questions of interest to reduce the number, and then transformed the questions of interest into individual items (e.g., rating scale questions and open-ended items for questionnaires, oral questions for interviews). Quantitative measurement techniques were emphasized in the construction of questionnaires. To reduce the burden placed on respondents, questionnaires and interviews were designed around a 20-minute and one-hour time limit, respectively[3].

The sources of information for the questionnaires and interviews varied depending on the particular data collection event. Specific versions of the instruments were prepared for the training audience members, support personnel, and trainers (such as observer/controllers, training managers, and exercise directors).

This general method produced a comprehensive package of paper-based instruments for each training event in which the FXXITP products were used during the project. In addition, special instruments were developed for the NTC events—the LTP and the brigade rotation—and the Janus simulation training exercise that employed only parts of established FXXITP products (described in Section 2). Appendix C contains sample data collection instruments, illustrating the approach for questionnaires, interview forms, and observation guides.

Data Collection Procedures

A principal goal of the assessment was to collect data at every opportunity at which the participating units used the various training products. Throughout the course of the ISAT

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[3] All instruments used outside the ISAT Team were reviewed by the U.S. Army Research Institute (ARI) Survey Office and assigned personnel test numbers.

project, there were six major events that were expected to provide opportunities for data collection:

- BSTS use
- Vignette use
- Conduct of the BSE
- NTC LTP
- Conduct of the BBSE
- NTC Rotation.

The majority of the data collection would take place in the home station environment, as the units used the various FXXITP products. In addition to the home station events, on-site data collection would occur during scheduled training exercises at the NTC, to gather information about the impact of the FXXITP training products on unit performance in an external evaluation environment. The NTC events included the LTP and scheduled unit rotations. A portion of the data from NTC events would be collected after the unit returned to home station. Throughout the assessment, early coordination with key leaders from the participating brigades would be emphasized to optimize the data collection opportunities.

The ISAT data collection involved use of the approved instruments designed for each of the data sources, following the data collection scheme shown in Figure 2. The matrix portrays the

Data Sources	Data Collection Events					
	BSTS Courses	Vignettes	BSE	LTP	BBSE	NTC Rotation
Training Audience	✓	✓	✓	✓	✓	✓
Support Personnel			✓		✓	
Trainers	✓	✓	✓	✓	✓	
Exercise Control Personnel					✓	
Simulation Center Staff					✓	
ISAT Observers	✓	✓	✓	✓	✓	✓
After Action Review Packages						✓

Figure 2. Planned sources of data and major assessment events.

focus of the data collection activities for each of the products and events of interest. For each training product, multiple data collection instruments typically were used to cover each of the data sources.

The ISAT team members were to serve as on-site data collectors in both the home station and NTC arenas. As the units planned and prepared for using the products, the on-site TSCs not only assisted, but also recorded questions, comments, and observations about product use. The TSC familiarity with the units' training situation, coupled with both military and FXXITP

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expertise, would make it possible to obtain clear and relevant insights concerning product use. During major collective training events, the on-site support cell was augmented by a surge team. The surge team data collectors were selected on the basis of active duty experience with mounted operations as well as familiarity with the FXXITP products. The surge team membership remained relatively stable across successive training events.

The data collectors received training by the ISAT Assessment Coordinator to: (a) explain the objectives of the assessment, (b) cover basic data collection assignments and scheduling, and (c) review the techniques for collecting observational, interview, and questionnaire data. The training emphasized the importance of remaining objective so that personal biases regarding the training products would not influence the collection of data.

The basic data collection procedures emphasized minimal intrusion on unit training activities, full participation of users in planned questionnaire and interview sessions, and prompt completion of data collection requirements. The on-site data collectors recorded their observations, administered questionnaires, conducted interviews, and gather data from supplemental sources. To record their observations, the collectors used observation guides and significant event logs to record factual information about events as well as their own observations and judgments. When conducting group interviews, the data collectors operated in two-person teams whenever possible, with one member taking notes of the discussion. Audio recordings backed up the note taking.

The ISAT team members planned to gather lessons learned information throughout the entire assessment, using special guides to capture a broad range of inputs. The lessons learned guides structured the capture process by prompting specific observations, judgments, and insights regarding each of the products. Inputs came from on-site observations, questionnaires, interview records, and significant event logs.

An additional occasion for obtaining observations about the FXXITP products came when the ISAT team was invited to brief the four products (BSTS, vignettes, BSE, and BBSE) for personnel from the 7 Army Training Center (ATC). The briefing included information sessions on each product, walkthroughs of the TSPs, and demonstrations of the training exercises. The feedback from the audience was not analyzed with the more systematically collected data, but is discussed in Sections 5 and 6.

Assessment Events and Data Collection

As described in Section 2, there were many departures from the implementation plans within both of the participating brigades. As a result, the data collection was less comprehensive than had been anticipated, and results were not easily interpretable. However, these difficulties had been anticipated and discussed among DTDD, ARI, and ISAT team researchers, and various corrective actions were taken in order to glean the greatest amount of usable information for the three areas of interest. Some of the adjustments were documented in the Modified Assessment Plan (HumRRO, 1998b), although other changes were necessitated throughout the project.

Because of the wide gap between the BSTS procedures specified in the FXXITP TSP and those actually used in the initial implementation, the questionnaire data from the Brigade A are not included in this report. At the same time, the extensive input regarding improvement of the BSTS products and the valuable lessons learned while working with this unit are fully represented in the following section.

Table 6 provides summary information about the amount of questionnaire and interview data obtained during the assessment. Due to competing requirements beyond the units' control, only one of the participating brigades was able to afford the ISAT team a complete range of data collection events from BSTS coursework through the unit's NTC rotation. Thus, the bulk of the data came from a single FORSCOM unit representing the Army's active duty brigades. Even within that one brigade, the return rate for questionnaires was very low despite intense efforts by ISAT TSCs and surge team members.

Table 6
Response Rate for ISAT Data Collections

Event	Brigade B		Brigade C	
	Participating	Providing Data	Participating	Providing Data
BSTS[a]	21	11	58	7
Vignettes[b]	19[c]	2	42[c]	17
Janus SIMEX[d]	—	—	61[c]	28
BBSE[e]	—	—	133[c]	34
LTP	—	—	41[c]	17
NTC Rotation	—	—	115[c]	13

Note. [a]For BSTS, "Participants" are those who at least worked on BSTS, whether or not they completed any lessons or courses. [b]For vignettes, "Participants" includes training audience members. [c]Approximate; numbers varied depending on the phase of the event. [d]For the Janus SIMEX, "Participants" includes training audience members, roleplayers, and simulation controllers. [e]For the BBSE, "Participants" includes training audience members and Observer/Controllers. BSTS = Battle Staff Training System; SIMEX = simulation exercise; BBSE = Brigade and Battalion Staff Exercise; LTP = leader training program.

Data Reduction and Analysis Procedures

In preparation for the data reduction and analysis, a database was constructed that accommodated the majority of the collected data. A family of files was created to correspond to the individual questionnaires. Only numerical data were entered into the database fields, with the aid of data entry screens constructed to facilitate keyboard entry directly from the questionnaires. Text fields and transcribed interview comments were entered into text files. The database served to generate organized data displays for inspection and to support descriptive statistical analysis of quantitative data.

As the data were collected from the training sites, the ISAT team entered them into the computer database. One team member entered the data directly from the completed questionnaires into the files, using data entry screens and keyboard. Two levels of quality control (QC) procedures were applied to the database contents. First-level QC was accomplished

by the data entry person. Second-level QC activities were performed by the database manager, who spot-checked database files and provided feedback to the data entry person.

The ISAT team analyzed the assessment data in two stages: quick-look processing of data as they became available, and comprehensive analysis and interpretation of cumulative data. The goal of this strategy was to identify key findings in a timely manner while reserving systematic conclusions for thorough analysis. Each of these stages entailed three steps:

- organization and reduction of data,

- qualitative and quantitative analysis, and

- interpretation of data.

Quick-look analyses. During the quick-look analyses, which occurred throughout the project, qualitative data were organized to facilitate rapid identification of high-impact findings. Issues of special interest were generated during conversations with ARI and DTDD, or were formulated as a result of significant events during the data collection, and raw data (e.g., interview notes, completed questionnaires) were assembled and collated that addressed the issues. In general, this process was organized to highlight recurring observations and potential contributions to fielding decisions. Qualitative techniques were then used to illuminate critical events, trends, and patterns. This process relied on the judgment of the team members to identify and enlighten noteworthy incidents and observations of immediate interest, with operational factors and implications in mind.

Comprehensive analyses. In preparation for the comprehensive analysis, the ISAT team segregated the data into qualitative and quantitative components. Qualitative data (comments, suggestions, etc.) were organized according to context and utility, for review and interpretation. For these purposes, the qualitative data items were tagged to indicate their source (e.g., brigade S3) and then sorted under a set of categories driven by the nature of the questions that elicited the responses. Quantitative measures were entered into data analysis files using the Statistical Package for the Social Sciences (SPSS). Data in the SPSS files generally required no computation or other reduction. The organization built into the database files mirrored the structure of the parent questionnaires.

For the comprehensive analysis, the team used a combination of qualitative and quantitative techniques. The ISAT SMEs and Assessment Coordinator studied the qualitative data to determine their value in answering the questions of interest. Quantitative data such as ratings and frequency counts were analyzed using descriptive statistics (e.g., means, standard deviations) when the sample sizes were sufficient. In addition, informal comparisons were performed between NTC performance of the participating units and at-large performance trends published by the Center for Army Lessons Learned (CALL). The small sample sizes and the lack of a control group precluded the use of most parametric and nonparametric statistical techniques (e.g., chi square, regression analysis) to analyze the quantitative data.

Summary

This section has described the purposes, objectives, and methods of the ISAT project's assessment of the FXXITP products. The assessment, focusing on product impact, was intended to be conducted in a routine operating environment and, thus, relied on the integration of the FXXITP products into unit training plans. The plans were modified continually, as necessitated by the circumstances of unit participation and resource constraints. The substitution of one brigade for another during the course of the project was only moderately disruptive. The effects on product implementation of competing demands on unit time, resources, and focus were a greater confounding issue.

Section 4. Results and Discussion

This chapter presents the major findings of the project's assessment and discusses their meaning. For reasons discussed in Sections 2 and 3, the bulk of the data came from Brigade C. In addition to data gathered during exercises using the FXXITP TSPs, this presentation summarizes data obtained during non-FXXITP product training events (i.e., the Janus SIMEX, LTP, and NTC rotation) and FXXITP product reviews. The combination of sources provides multi-faceted information regarding the acceptability, impact, and supportability of the FXXITP products. As discussed in Section 3, those three areas address different aspects of the products' quality and utility:

- Acceptability—Were the training materials doctrinally correct? Were they usable? Were other materials necessary?

- Perceptions of Impact—Were the training products useful for learning and practicing job requirements and preparing for other major training events? Did users think that the training had (or would have) a positive effect on performance?

- Supportability—What would it take to make the training products useable within a brigade's training plan?

Both qualitative and quantitative results are discussed.[4] Because of the small sample sizes, analysis of quantitative data is limited to descriptive techniques. As a general rule, this section will present the data for each of the products in a standard sequence, beginning with acceptability and ending with supportability. Data from the non-FXXITP events will be incorporated wherever they shed light on a particular product. The section concludes with results relating to the assessment of the FXXITP as a whole, and how the individual products combined to produce effects on LTP and NTC performance and on the unit training program. Table 7 identifies the events that contributed to the assessment of each of the FXXITP products.

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[4] Compiled quantitative data from the questionnaires completed during the assessment, write-in comments from the same questionnaires, and interview transcripts have been provided to U.S. Army Research Institute (ARI). The quantitative data are in SPSS files, while the questionnaire comments and interview transcripts are in MS Word® files.

Table 7
Force XXI Training Program Products and Assessment Events

Events Contributing Data Relevant to Products	Products			
	BSTS	Vignettes	Janus SIMEX	BBSE
BSTS implementations	X			
Vignette implementations	X	X		
Janus SIMEX	X	X	X	
LTP	X	X	X	
BBSE	X	X	X	X
NTC rotation	X	X	X	X

Note. BSTS = Battle Staff Training System; SIMEX = simulation exercise; BBSE = Brigade and Battalion Staff Exercise; LTP = leader training program.

Interpretation of assessment data relied heavily on close collaboration between the ISAT team's assessment personnel and SMEs. The SMEs provided important input to ensure realistic consideration of operational and tactical factors. The team used audit trail data, including information captured in the significant events logs, to shed light on trends of special interest, with emphasis on the units' implementation and management procedures.

The turnover of key personnel on the various brigade and battalion staffs was a confounding factor. A few staff officers participating in NTC training had not used the FXXITP products, and equally few who used the products were absent for NTC exercises. However, not all eligible personnel provided data during any given data collection opportunity.

One concern was the possible influence of simply involving the participants in an "assessment." Equipping the units with new training tools and signaling expectations of improved performance could, by itself, lead to faulty evidence of positive effects—especially among subjective data. This phenomenon—known as the "Hawthorne effect"—is discussed by Cook and Campbell (1979), who state that there is not a great deal of evidence of the effect occurring in field experiments. In the absence of a control condition, the team relied primarily on patterns of indicators (convergence and divergence among related measures) to gauge the true contributions of the FXXITP products.

<u>Battle Staff Training System</u>

Personnel from all three brigades conducted BSTS courses to assist in the project's assessment. Due to the abbreviated participation of Brigade A and the unique implementation by Brigade B, however, the assessment described presently is based primarily on the experiences and feedback from Brigade C. The assessment presents data from course participants and also from reviews from 7ATC. As the BSTS is designed for use early in a brigade's or battalion's training cycle, subsequent training events (e.g., vignettes, LTP, NTC) served as vehicles to gather information regarding the more extended effects of BSTS at its integration into a training plan.

Battle Staff Training System Acceptability

Acceptability data were gathered following BSTS implementations from September and December of 1998 and during the 7ATC review of selected courses. Both brigade and task force users from Brigade C provided feedback via questionnaires and interviews on the currency of the doctrine taught and the capacity of the TSP to support implementation. The numbers of individuals responding were very small, leading us to discuss the findings in very general terms of trends and indicators.

Table 8 shows the breakout of the feedback on OPORDS, graphic overlays, and practical exercise materials from the few Brigade C respondents. A majority of the participants (67% - 80%) indicated that the course materials were consistent with current doctrine. A key comment from the 7ATC reviewers during their visit was that the course material, while doctrinally sound, did not reflect a Division XXI structure along with its updated doctrine and digitization. Based on this feedback, it is realistic to conclude that the BSTS is sufficiently acceptable doctrinally, but that it must still be updated so that future commanders can keep their units up to speed on new and continually evolving doctrine.

Table 8
Perceptions of Doctrinal Currency of Battle Staff Training System Materials

Material	Inconsistent or Totally Inconsistent	Neither	Consistent or Totally Consistent	N
Operation orders	0	1 (20%)	4 (80%)	5
Graphic overlays	1 (20%)	1 (20%)	3 (60%)	5
Practical exercise materials	2 (33%)	0	4 (67%)	6

The capacity of the TSP to support training was assessed by examining how easily participants were able to use the materials, how well the course materials supported the conditions for successful training, and whether or not the amount of time spent on the training was acceptable. As shown in Table 9, participants were generally able to find information in the TSP. Of the 7 participants, 6 agreed (to a moderate, great, or very great extent) that the course materials established the conditions necessary for successful training. Only 3 of 7 participants indicated that the amount of time required by the training was acceptable; the other 4 participants were split—2 thought the amount of time was unacceptable and 2 were neutral.

Table 9
Perceptions of Usefulness Battle Staff Training System Materials

Questionnaire Item				
How easy to find information	**Difficult or Very Difficult**	**Neither**	**Easy or Very Easy**	**N**
...in student guides	0	1 (17%)	5 (83%)	6
...in computer-based modules	1 (14%)	1 (14%)	5 (71%)	7
	No Extent or Slight Extent	**Moderate Extent**	**Great Extent or Very Great Extent**	**N**
Extent to which materials establish conditions necessary for successful training	1 (14%)	2 (28%)	4 (57%)	7
	Not Acceptable	**Neutral**	**Acceptable**	**N**
Acceptability of time required by the training	2 (28%)	2 (28%)	3 (43%)	7

Table 10 summarizes major recommendations for enhancing the BSTS. Many of the items pertain primarily to use of the courseware in a stand-alone EMMii environment. If a new programming environment were adopted, recommendations specific to EMMii (e.g., transfer and recovery of data in stand-alone mode, pre-test management) would become irrelevant. Further, if the library were transitioned to an Intranet/Internet environment, some of the program start-up recommendations would be unneeded.

Table 10
Summary of Recommended Battle Staff Training System Training Support Package
Enhancements

Category	
Problem	**Recommendation**
Printed Materials	
Critical information is difficult to find in the student instructions of the course workbook .	Redesign the student workbook for ease of use (e.g., detailed table of contents).
Providing workbook materials in only hard-copy form increases the risk of loss of materials or assembly errors during duplication.	Place master copy of all workbook materials (text, job aids, and graphics) on user-friendly CD-ROM.
Electronic files of workbook text and job aids are in a format inconsistent with current Army standards.	Convert workbook text and job aid files to Army standard format.
TSP contains no materials to help trainers diagnose and solve technical problems.	Add a troubleshooting guide for the system administrator to the TSP.

table continues

Table 10 (continued)

Category	
Problem	**Recommendation**

Instructional Software

Critical student instructions appear only in printed materials or read-me files, making it easy for a student to miss them.	Place instructions in a CBI module to be completed before lessons can begin. Add help files.
Current software does not limit the number of times a subject pre-test can be taken, allowing a student to bypass the training objectives.	Modify student software to prevent taking a subject pre-test more than once.
Mixing paper and CBI materials breaks up the flow of lessons and complicates the instructional process.	Convert entire set of courses to 100% CBI, eliminating the course workbooks.
Out-of-date information draws criticism from the training audience and degrades the face validity of the courses.	Establish a continuing mechanism for updating doctrine, terminology, and symbols reflected in the TSPs.
Relying on CD-ROM technology requires multiple sets for each unit and makes updating cumbersome.	Migrate the entire course library to an Intranet/Internet environment.

Note. TSP = training support package; CBI = computer-based instruction.

Battle Staff Training System Impact

Impact data were concerned with measuring the effects of BSTS on individual and unit performance. The data were gathered following BSTS implementations as well as during subsequent training events (i.e., vignettes, LTP, BBSE, and NTC rotation). The feedback on impact represents measures of perceived or estimated impact, rather than objectively determined effects of the training.

Following implementations of the BSTS courses, users were asked four questions regarding the benefits of BSTS to the individual user. When asked to what extent the course allowed for the practice of battle techniques, 4 of 7 respondents were positive. On the second item, 5 of 7 respondents said that the BSTS only slightly improved their understanding of their tasks; there were no respondents who indicated that their task understanding had not improved at all. Similarly, user understanding of the staff was reported to be improved to a slight or moderate extent by all seven respondents. Improvements in task performance were estimated to be slight to moderate, as three respondents indicated they improved a slight extent, three to a moderate extent, and only one to no extent at all. Results are presented in Table 11.

Table 11
Perceptions of the Impact of Battle Staff Training System on Individual Users

Area of Impact	No Extent or Slight Extent	Moderate Extent	Great Extent or Very Great Extent	N
Enabled practice on battle techniques	3 (43%)	2 (29%)	2 (29%)	7
Improved understanding of tasks	5 (71%)	1 (14%)	1 (14%)	7
Improved understanding of the staff	3 (43%)	4 (57%)	0	7
Improved task performance	4 (57%)	3 (43%)	0	7

Given frequent user comments about the "refresher" role of BSTS course work, the training audience may have distinguished between acquiring genuinely new knowledge and reinforcing knowledge they had acquired earlier. For example, one battalion commander successfully passed every subject pre-test without taking any lessons, but he stated "... the various exams allowed me to self-assess areas where I need to do some homework." When it came to the ability to perform individual tasks, the training audience may have reasoned that their performance as a staff officer is too dependent on group interaction to benefit directly from individual self-study.

Another aspect of impact reflected the need to determine the product's potential impact on unit performance. As seen in Table 12, most BSTS training audience respondents judged that the course offerings contributed to their unit's training program to a moderate extent or greater (86%) and enhanced the unit's combat readiness (71%). More than 70% estimated the courses saved unit training time and funds.

Table 12
Perceptions of the Impact of Battle Staff Training System on the Unit

Area of Impact	No Extent or Slight Extent	Moderate Extent	Great Extent or Very Great Extent	N
Help meet staff training goals	1 (14%)	3 (43%)	3 (43%)	7
Enhance unit combat readiness	2 (28%)	3 (43%)	2 (28%)	7
Save unit training time	1 (14%)	4 (57%)	2 (28%)	7
Save unit training funds	2 (28%)	3 (43%)	2 (28%)	7

Finally, respondents were asked to rate the utility of the BSTS by indicating the extent to which the benefits of the courses outweighed the costs, and the extent to which their own brigade as well as other brigades should use BSTS. On all three items, results were positive, as shown in Table 13. Seventy-one percent of the respondents said that the benefits outweighed the costs to a great or very great extent. More than 70% agreed that the BSTS should be used in the future by their own unit and other units.

Table 13
Perceptions of the Future Utility of the Battle Staff Training System

Measure	No Extent or Slight Extent	Moderate Extent	Great or Very Great Extent	N
Benefits outweigh costs	1 (14%)	1 (14%)	5 (71%)	7
Own brigade or task force should use	1 (14%)	0	6 (86%)	7
Other brigades or task forces should use	1 (14%)	1 (14%)	5 (71%)	7

Impact data collected following implementation were supplemented with data collected as the unit proceeded through its yearly training plan. Following critical events in their plan, follow-up assessment items were posed to the brigade to re-assess the perceived impact that

Impact data collected following implementation were supplemented with data collected as the unit proceeded through its yearly training plan. Following critical events in their plan, follow-up assessment items were posed to the brigade to re-assess the perceived impact that BSTS was having on the brigade. The vignettes and Janus SIMEX represented the first two subsequent assessment opportunities.

Following the conduct of two vignettes, brigade and battalion staff members who had used their BSTS courses were asked whether or not the BSTS was perceived as having helped them prepare for the vignette-type exercises (Table 14). Feedback was marginal, but no respondents indicated that the BSTS had not been helpful. Of participants in the Mission Analysis vignette, 2 of 5 agreed that the BSTS coursework had been helpful; 3 were neutral. Of participants in the Course of Action Analysis vignette, the only participant who had also done the BSTS agreed that the BSTS had helped in preparation for the vignette.

Table 14
Perception of Utility of Battle Staff Training System (BSTS) in Preparing for Vignettes

Questionnaire Item	Not Helpful or Slightly Helpful	Neutral	Helpful or Very Helpful	N
How much BSTS helped in preparing for				
... Mission Analysis Vignette	0	3 (60%)	2 (40%)	5
...Course of Action Vignette	0	0	1	1

Following the Janus SIMEX, participants indicated whether or not the BSTS had helped prepare them for the exercise. Of the 11 respondents, 8 were neutral, and 3 agreed that the BSTS had helped them prepare for the Janus SIMEX (see Table 15).

Table 15
Perception of Utility of Battle Staff Training System (BSTS) in Preparing for Janus-based Simulation Exercise (SIMEX)

Questionnaire Item	Not Helpful or Slightly Helpful	Neutral	Helpful or Very Helpful	N
How much BSTS helped in preparing for Janus SIMEX	0	8 (73%)	3 (27%)	11

The unit's trip to LTP at the NTC represented the next opportunity to assess the impact of BSTS. The LTP participants who had taken part in BSTS courses were presented with six questionnaire items on the subject. Results for the six items are presented in Table 16.

The first two items dealt with preparation time, and inquired to what extent the BSTS courses helped the unit use their preparation time more effectively, and to what extent the BSTS courses actually saved the unit time in preparing. Results on these two items were generally positive, with 11 of 14 on both items recording a response of moderate, great, or very great extent.

Table 16
Perceptions of the Impact of Battle Staff Training System (BSTS) on Unit Leader Training
Program (LTP) Performance

Questionnaire Item	No Extent or Slight Extent	Moderate Extent	Great Extent or Very Great Extent	N
Enabled unit to use preparation time more effectively	3 (21%)	9 (64%)	2 (14%)	14
Saved unit preparation time for the LTP	3 (21%)	4 (29%)	7 (50%)	14
Provided LTP-relevant knowledge and skills	3 (21%)	5 (36%)	6 (43%)	14
Own brigade should use	4 (24%)	11 (65%)	2 (12%)	17
Other brigades should use	4 (25%)	8 (50%)	4 (25%)	16
	Very Harmful or Slightly Harmful	Neutral	Beneficial or Very Beneficial	N
How BSTS affected LTP performance	1 (8%)	4 (33%)	7 (58%)	12

Another item asked to what extent the BSTS courses had provided LTP-relevant knowledge and skills. Participants again were positive—11 of 14 indicated that the courses had provided knowledge or skills to a moderate or great extent.

Participants were asked again whether or not their own and other brigades should use BSTS. A full 77% of the brigade staff respondents agreed their own unit should use the BSTS courses for future training, and 75% stated that other units should use the courses.

A summary of the impact of BSTS on LTP performance was collected on one item which asked the question: "Overall, how did BSTS affect your performance at LTP?" Of the 12 respondents, one indicated that the BSTS was harmful, and another four respondents said that the BSTS was neither harmful nor beneficial. Seven respondents, however, said that the courses had been beneficial or very beneficial.

The remaining two training events were the BBSE and NTC rotation. After the BBSE, respondents suggested that the BSTS had a modest effect in helping their unit prepare for the BBSE (Table 17). Of 20 respondents, one indicated to a very great extent, 11 to a moderate extent, 5 to a slight extent, and 3 to no extent.

Table 17
Perceptions of the Impact of Battle Staff Training System (BSTS) on Brigade and Battalion Staff
Exercise Performance (BBSE)

Questionnaire Item	No Extent or Slight Extent	Moderate Extent	Great Extent or Very Great Extent	N
How much BSTS helped unit prepare for the BBSE	8 (40%)	11 (55%)	1 (5%)	20

The concluding event of the unit's training plan was the NTC rotation. At this event, participants were asked four questions regarding the impact of BSTS. The first item asked to what extent the BSTS courses had contributed to improvements made in the brigade's staff process. Three out of 5 brigade-level respondents indicated to a moderate extent, and 4 of 5 task force respondents indicated to a moderate extent.

The second post-NTC question asked about the extent to which respondents would use the BSTS courses to sustain their performance. Feedback on this item was mixed, as was feedback on the third item that asked to what extent other brigades or task forces should use the BSTS for NTC preparation (see Table 18).

Table 18
Perceptions of Battle Staff Training System Impact Following the National Training Center (NTC) Rotation

Measure Respondent	No Extent or Slight Extent	Moderate Extent	Great or Very Great Extent	N
Improved staff process				
Brigade staff	2 (40%)	3 (60%)	0	5
Task force staff	1 (20%)	4 (80%)	0	5
Own brigade or task force should use to sustain proficiency				
Brigade staff	1 (20%)	1 (20%)	3 (60%)	5
Task force staff	3 (50%)	3 (50%)	0	6
Other brigades or task forces should use for NTC preparation				
Brigade staff	0	1 (25%)	3 (75%)	4
Task force staff	3 (50%)	3 (50%)	0	6

Finally, participants were asked about the overall impact of BSTS on NTC performance. Both brigade and task force staffs were positive (Table 19) with 2 of 4 (50%) and 4 of 6 (67%), respectively, indicating that the BSTS courses had been beneficial, while 2 of 4 (50%) and 2 of 6 (33%) respondents on each item indicated the BSTS had been neither beneficial nor harmful.

Table 19
Perceptions of Battle Staff Training System Impact on National Training Center Performance

Respondent	Harmful or Very Harmful	Neither	Beneficial or Very Beneficial	N
Brigade staff	0	2 (50%)	2 (50%)	4
Task force staff	0	2 (33%)	4 (67%)	6

Battle Staff Training System Supportability

Recommendations to increase the supportability centered on expanding the quantities of key course materials, making tactical graphics readily available, the training management system, and program startup. The problems and recommendations are presented in Table 20.

Table 20
Problems and Recommendations Regarding Battle Staff Training System Supportability

Category

Problem	Recommendation
Basis of Issue	
Issuing one brigade set and three battalion sets to a brigade created bottlenecks when staff assistants were tasked to complete courses.	Issuing six battalion sets to the brigade enabled all maneuver and support battalions to work on courses at the same time.
Issuing one EMMii CD-ROM with each brigade or battalion set created bottlenecks when several students in a unit wanted to load software on unit-owned or student-owned computers at the same time.	Issuing three EMMii CD-ROMs with each brigade or battalion set enabled more staff officers to load system software without delay.
Issuing one brigade and one battalion COMPS CD-ROM to a participating brigade created bottlenecks when several students were ready to take the COMPS at the same echelon.	Issuing three COMPS CD-ROMs with each set of courseware enabled more students to take the end-of-course comprehensive exam at the same time.
Accessibility of Overlays	
Providing COMPS overlays only in Adobe Acrobat™ format caused delays when some students had to locate a copy of Adobe Acrobat Reader™.	Providing a copy of Adobe Acrobat Reader™ shareware on each student CD-ROM enabled immediate viewing of overlays.
Printing electronic overlays to obtain hardcopies led to "cut-and-paste" assembly when plotters were not available.	Including a full-size paper copy of each COMPS overlay in each set of courseware made it easier for unit personnel to reproduce overlays.
Training Management System	
Placing EMMii student software on a separate CD-ROM increases the total number of CD-ROMs a student must work with.	Place EMMii student files on the CD-ROM set containing lesson files.
Awkward and confusing procedures for manual transfer of performance data make it easy for critical errors to occur.	Modify student software to simplify the transfer process and add safeguards (e.g., confirmation windows).
Lack of capability for a system administrator to recover lost or corrupted data can lead to an incomplete performance database.	Modify the software suite to enable a system administrator to recover data from a student computer.

table continued

Table 20 (continued)

Category

Problem	Recommendation
In a local area network environment, the TMS places all data in a common file, precluding unit-specific reports.	Migrate the software suite to a commercial off the shelf (COTS) product offering greater flexibility.
Manual transfer of data in stand-alone mode places an extra administrative burden on unit personnel.	Migrate the software suite to a COTS product that supports uploading of data via Intranet/Internet.

Program Start-up

Problem	Recommendation
Shipping courseware sets without an inventory of components that make up a complete set can confuse unit personnel.	Include an inventory list showing all components of a set (lesson materials, COMPS CD-ROMs, operation orders, overlays).
Lack of information about unit computer assets can lead to implementation difficulties.	Survey computer assets of target units in time to influence fielding plans and schedule.
Failure to resolve training management issues prior to use of BSTS courses can degrade the value realized from the training program.	Inform unit leaders of training management issues, specifying minimum lead time required to make decisions.
The TSP materials are not sufficiently detailed to enable unit personnel to conduct orientation and train-the-trainer sessions.	Expand the orientation and train-the-trainer components of the TSP to include a narrative script.
BSTS/TMS setup and technical training require system knowledge that unit personnel do not have.	Create support base of fully knowledgeable system expert(s).

Note. EMMii = Environment for MultiMedia interactive instruction; COMPS = comprehensive assessment component; TMS = training management system; COTS = commercial off the shelf software; BSTS = Battle Staff Training System; TSP = training support package.

In addition to the foregoing, observations indicated that the BSTS should include an instructional module on the EMMii CD-ROM to succinctly describe equipment and facilities requirements, course administration duties, training audience, map requirements, and so on. Additionally, the TMS component should inform unit leaders regarding product utilization (e.g., guidelines for selecting and scheduling courses and exercises). A fold-out and a video or interactive multimedia CD-ROM, including demonstration clips of products in action, would be highly desirable. The product utilization and training management components should focus on specific actions that unit leaders need to take.

Vignettes

The vignettes were implemented by Brigade B and Brigade C. However, Brigade B, which executed four vignettes, utilized very few of the TSP materials. Brigade C conducted two vignettes, generally according to the intended model. The vast majority of the assessment data comes from Brigade C, while information from Brigade B is used to reinforce project conclusions regarding the acceptability, impact, and supportability of vignettes in general. Again, 7ATC conducted a review of the vignettes during the timeframe of the ISAT project.

Points made during the review are included in the assessment, along with Brigade C's vignette-related feedback obtained during its Janus SIMEX, LTP, BBSE, and NTC rotation.

Vignette Acceptability

Acceptability data were gathered following vignette implementations and during the 7ATC review. Participants from Brigade C provided feedback via questionnaires and interviews on the currency of the doctrine taught and the capacity of the TSP to support implementation.

As shown in Table 21, participants indicated that the TSPs were consistent with current doctrine. Most inconsistencies related to the lack of a Force XXI task organization. While this should be corrected as updates are made in the future, none of the noted inconsistencies proved to be significant detractors during the conduct of the exercises. The trend was that the lack of currency was noted by less senior officers, and dismissed as "below the noise level" by more senior officers.

Table 21
Participant Perceptions of the Doctrinal Currency of Vignette Materials

Vignette Material	Inconsistent or Totally Inconsistent	Neither	Consistent or Totally Consistent	N
Mission Analysis Vignette				
Operation order/annexes	1 (9%)	1 (9%)	9 (82%)	11
Overlays	1 (11%)	0	8 (89%)	9
Job aids	0	1 (14%)	6 (86%)	7
Vignette tasks	0	1 (20%)	4 (80%)	5
Sample products	1 (17%)	1 (17%)	4 (66%)	6
Course of Action Vignette				
Operation order/annexes	1 (25%)	1 (25%)	2 (50%)	4
Overlays	1 (20%)	1 (20%)	3 (60%)	5
Job aids	1 (33%)	1 (33%)	1 (33%)	3
Vignette tasks	0	1 (33%)	2 (67%)	3
Sample products	0	0	4 (100%)	4

Other acceptance criteria included how easily the guides were used, the extent to which the TSPs were viewed as supporting successful training, and whether the amount of time required by the exercises was acceptable (Table 22). Most of the respondents found it easy or very easy to locate information in the Participant Guide (80% for one vignette and 50% for the other). Respondents also indicated that the TSPs supported implementation and that the time needed for vignette preparation was generally acceptable.

Table 22
Perceptions of Usefulness of Vignette Materials

Questionnaire Item				
How easy to find information	Difficult or Very Difficult	Neutral	Easy or Very Easy	N
...in Mission Analysis Participant Guide	1 (10%)	1 (10%)	8 (80%)	10
...in Course of Action Participant Guide	0	1 (50%)	1 (50%)	2
Extent to which materials establish conditions necessary for successful training	No Extent or Slight Extent	Moderate Extent	Great or Very Great Extent	N
... in Mission Analysis Vignette	0	1 (10%)	9 (90%)	10
...in Course of Action Vignette	1 (25%)	2 (50%)	1 (25%)	4
Acceptability of the time required by	Unacceptable or Totally Unacceptable	Neutral	Acceptable or Totally Acceptable	N
...Mission Analysis Vignette	1 (8%)	3 (25%)	8 (67%)	12
...Course of Action Vignette	0	2 (50%)	2 (50%)	4

The unit provided a number of comments on how to improve the vignette TSPs. They pointed out discrepancies in the Tables of Organization and Equipment (TOEs) provided in the COA Analysis vignette TSP. This was due to changes in unit TOEs since the publication of the TSP. Examples noted included the engineer battalion depicted having Combat Engineer Vehicles, which are no longer assigned. And a field artillery battery has eight guns, as opposed to six guns under the new Paladin TOE.

There were additional shortfalls noted by the participants in the tactical materials provided in the TSP. Some of these shortfalls were: the use of the old double block to depict enemy units on overlays as opposed to the new diamond depiction; division operations appendix included corps sketch depicting mission, but not one for division; the situation update did not give locations of units outside of 3rd Brigade area of operations; and the Division Support Command (DISCOM) plan was not included with the division order.

Additionally, the changes shown in Table 23 were recommended for the COA Analysis vignette.

Table 23

Summary of Recommended Course of Action Vignette Enhancements

Area	
Recommendation	

Tactical Materials

- Provide ADA graphics in 1:50,000 instead of 1:250,000
- Provide complete CSS background materials and information (e.g., movement rates, trafficability of routes)
- Fix incomplete CSS map graphics (e.g., partial main supply route)
- Revise CSS concept to ensure consistency with OPORD and reflect support forward
- Add newer equipment (such as Palletized Loading System) to CSS materials
- Modify artillery Modified TOE and scheme of maneuver to reflect M109A6 Paladin
- Strengthen and focus commander's guidance
- Expand R&S materials and information, to include specific commander's guidance
- Expand enemy information
- Focus intelligence products on NTC OPFOR

Assessment Materials

- Add criteria for comparing courses of action and weighting the decision matrix

Note. ADA = air defense artillery; CSS = combat service support; OPORD = operation order; TOE = Table of Organization and Equipment; R&S = reconnaissance and surveillance; NTC = National Training Center; OPFOR = opposing forces.

Vignette Impact

Impact data were concerned with measuring the effects of vignettes on individual and unit performance. The data were gathered following vignette implementations as well as after the Janus SIMEX, LTP, BBSE, and NTC rotation.

After the implementation of two vignettes, participants were questioned about the perceived effects of the vignettes on the individual participants. Vignettes are expected to allow for the practice of warfighting skills and improve task understanding, task performance, and teamwork skills. Thus, questions were framed around these expectations. For both vignettes, responses were positive (see Table 24). Respondents believed the vignettes provided practice opportunities, and that they were able to improve (generally to a moderate or great extent) both understanding and performance as intended.

Table 24

Perceptions of the Impact of Vignettes on Individual Users

Vignette Area of Impact	No Extent or Slight Extent	Moderate Extent	Great Extent or Very Great Extent	N
Mission Analysis Vignette				
Enabled practice on warfighting techniques	1 (08%)	4 (33%)	7 (58%)	12
Improved understanding of tasks	2 (17%)	7 (58%)	3 (25%)	12
Improved teamwork skills	2 (17%)	5 (42%)	5 (42%)	12
Improved task performance	2 (17%)	8 (67%)	2 (17%)	12
Course of Action Vignette				
Enabled practice of warfighting techniques	0	2 (40%)	3 (60%)	5
Increased task understanding	0	4 (80%)	1 (20%)	5
Improved teamwork skills	0	1 (20%)	4 (80%)	5
Improved task performance	0	2 (40%)	3 (60%)	5

Questionnaire items also addressed the effects of the vignettes on the unit and its training. Responses to these items are contained in Table 25. Most of the training audience respondents felt that the Mission Analysis vignette helped the brigade (a) meet its staff training goals to a moderate extent or greater and (b) become better prepared for the LTP. Similarly, a high percentage (75% or greater) indicated that the vignette enhanced the brigade's combat readiness to a moderate extent or greater. Perceptions of the Course of Action vignette were less favorable, but still generally positive regarding meeting training goals and preparing for LTP.

Table 25

Perceptions of the Impact of Vignettes on the Unit

Vignette Area of Impact	No Extent or Slight Extent	Moderate Extent	Great Extent or Very Great Extent	N
Mission Analysis Vignette				
Help meet staff training goals	0	3 (25%)	9 (75%)	12
Better prepare unit for Leader Training Program	0	3 (25%)	9 (75%)	12
Enhance unit combat readiness	0	3 (25%)	9 (75%)	12
Save unit training time	0	4 (33%)	8 (67%)	12
Save unit training funds	1 (8%)	6 (50%)	5 (42%)	12
Course of Action Vignette				
Help meet staff training goals	0	3 (75%)	1 (25%)	4
Better prepare unit for Leader Training Program	0	3 (75%)	1 (25%)	4
Enhance unit combat readiness	1 (25%)	2 (50%)	1 (25%)	4
Save unit training tine	1 (25%)	1 (25%)	2 (50%)	4
Save unit training fund	2 (50%)	0	2 (50%)	4

Regarding the future utility of the vignettes, participants were asked to rate the extent to which the benefits outweighed the costs and whether their brigade and other brigades should use the vignettes in the future. Results were positive, as provided in Table 26, with most respondents agreeing that both vignettes should be used in the future. These results indicate strongly that the training audience perceived the training value, both past and future, in the vignette exercises.

Table 26
Perceptions of the Future Utility of the Vignettes

Vignette Measure	No Extent or Slight Extent	Moderate Extent	Great or Very Great Extent	N
Mission Analysis Vignette				
Benefits outweigh costs	0	3 (25%)	9 (75%)	12
Own brigade should use	0	0	12 (100%)	12
Other brigades should use	0	0	12 (100%)	12
Course of Action Vignette				
Benefits outweigh costs	0	2 (50%)	2 (50%)	4
Own brigades should use	2 (40%)	1 (20%)	2 (40%)	5
Other brigades should use	1 (20%)	2 (40%)	2 (40%)	5

The next opportunity to assess the effects of the vignettes was during the Janus SIMEX conducted by Brigade C. Participants were asked whether they agreed or disagreed that the vignette had enabled them to get more out of the Janus SIMEX. Of 14 respondents, 6 agreed that the vignettes had helped (see Table 27). Eight neither agreed nor disagreed.

Table 27
Perception of Utility of Vignettes in Preparing for Janus-based Exercise

Questionnaire Item	Not Helpful or Slightly Helpful	Neutral	Helpful or Very Helpful	N
How much vignettes helped in preparing for Janus SIMEX	0	8 (57%)	6 (43%)	14

Note. SIMEX = simulation exercise.

Following the brigade's LTP, several questions were asked about the impact of vignettes on LTP train-up and performance. As shown in Table 28, 87% of respondents said that the vignettes had provided LTP-relevant knowledge and skills to a moderate or great extent. Eighty percent said that the vignettes allowed them to use their preparation time more effectively, and 67% said that the vignettes had helped the unit save preparation time. When asked to what extent their own and other brigades should use the vignettes to prepare for future LTPs, 81% of the brigade staff respondents agreed their own unit should use the vignettes for future training, and 69% felt other units should use the vignettes.

Table 28

Perceptions of Vignette Impact on Unit Leader Training Program (LTP) Performance

Area of Impact	No Extent or Slight Extent	Moderate Extent	Great Extent or Very Great Extent	N
Enabled unit to use preparation time more effectively	3 (20%)	4 (27%)	8 (53%)	15
Saved unit preparation time for the LTP	5 (33%)	5 (33%)	5 (33%)	15
Provided LTP-relevant knowledge and skills	2 (13%)	6 (40%)	7 (47%)	15
Own brigade should use	3 (19%)	5 (31%)	8 (50%)	16
Other brigades should use	5 (31%)	4 (25%)	7 (44%)	16

Following the unit's BBSE implementation, participants were asked to what extent the vignettes helped prepare them for the BBSE (see Table 29). Of 8 respondents, 5 said to a moderate extent and 3 to a great or very great extent. No respondents selected the slight extent or not at all options.

Table 29

Perceptions of the Impact of Vignettes on Brigade and Battalion Staff Exercise (BBSE) Performance

Questionnaire Item	No Extent or Slight Extent	Moderate Extent	Great Extent or Very Great Extent	N
How much vignettes helped unit prepare for the BBSE	0	5 (62%)	3 (38%)	8

The unit's NTC rotation provided the final assessment opportunity. Participants were asked about their own and other units' future use of the vignettes in preparation for NTC rotations, as well as about the overall impact of the vignettes on NTC performance. As shown in Table 30, ratings for future use of the vignettes were high, while ratings of the impact of vignettes on NTC performance were mixed.

Table 30

Perceptions of Future Utility of Vignettes for Preparing for National Training Center Rotations

Measure Respondent	No Extent or Slight Extent	Moderate Extent	Great Extent or Very Great Extent	N
Own brigade should use to sustain proficiency				
Brigade staff	0	2 (40%)	3 (60%)	5
Task force staff	0	1 (50%)	1 (50%)	2
Other brigades should use for NTC preparation				
Brigade staff	0	2 (40%)	3 (60%)	5
Task force staff	0	3 (75%)	1 (25%)	4

Table 31 shows that, among combined brigade and task force participants, 4 of 9 respondents (45%) said the vignettes were neither harmful nor beneficial, while the 5 respondents (55%) said the vignettes were beneficial to their NTC performance.

Table 31
Perceptions of Vignette Impact on National Training Center Performance

Respondent	Harmful or Very Harmful	Neither	Beneficial or Very Beneficial	N
Brigade staff	0	1 (20%)	4 (80%)	5
Task force staff	0	3 (75%)	1 (25%)	4

Vignette Supportability

This section contains recommendations regarding the supportability and use of the vignettes. The information is a consolidation of unit feedback and ISAT team observations and conclusions and unit feedback. Many of the comments and observations focused on the train-up for the use of vignettes (orientation briefing and workshop), which took place only days before the scheduled execution of the first vignette. Other attention was centered on the tactical products, the job aids, and the terrain database. The most frequent comments are summarized in Table 32.

Table 32
Problems and Recommendations Regarding Vignette Supportability

Category Problem	Recommendation
Vignette Start-Up Training	
Vignettes not integrated into unit's training plan	Conduct at least a month prior to vignette implementation. This would permit brigade leaders to assess their current training needs, understand the content of the vignettes, and select/schedule high-payoff vignettes.
	Restructure the vignette orientation briefing and workshop training to enable the brigade to assess their current level of expertise, comprehend the content of the vignettes, and determine the which vignettes should be used for their training, and when the vignettes should be scheduled.
	Modify briefing to emphasize purpose of vignettes, that they are designed to allow use of staff procedures.
Unit leaders did not understand how to match vignettes to training need	Organize vignettes and synchronize scenarios to represent discrete steps in the plan-prepare-execute sequence of an integrated scenario story line. The family of resulting exercises would be sequentially related, one event leading to or setting the stage for the next. The major tasks or challenges facing a staff would be represented in an orderly array, and specific exercises could be selected based on known weaknesses.

table continues

Table 32 (continued)

Category Problem	Recommendation
Tactical Materials	
Tactical materials do not reflect actual equipment and task organization	Include electronic copies of the orders on CD-ROM, so unit staff could modify the files and then print the unit-specific products.
Job Aids	
Purpose of job aids not clear, confusing when compared to BSTS job aids	Discuss differences with BSTS job aids, which are primarily information documents, cheat sheets for combat ratios, movement ratios, computing engineer work timetables.
	Add doctrinal charts showing the military decision-making process in Field Manual 101-5 (Department of the Army, 1997). Vignette job aids present formats and techniques used during planning, many based on those developed by units or Combat Training Centers.
	Update and synchronize the vignette, BSE/BBSE and BSTS job aids to reflect current doctrine, terms and graphics (enemy capabilities, new equipment such as Paladin and Palletized Loading System, new combat service support concepts, latest Modified TOE).
Terrain Database	
BBS terrain does not conform to current map standards	Update BBS terrain database files (and overlays) to reflect WGS84, 100,000 meter grid zone designators so we don't have to reconfigure map boards to accommodate nonstandard overlays or chase hard-to-find, outdated map sheets. In the interim, add errata sheet to the training support packages detailing conversion of 100,000 meter grid zone designators from WGS84 system to Defense Mapping Agency, Clarke 1866 spheroid, system.

Note. BSTS = Battle Staff Training System; BSE = Brigade Staff Exercise; BBSE = Brigade and Battalion Staff Exercise; TOE= Table of Organization and Equipment.

All of these recommendations are worthy of further examination, but have not been evaluated within this study. For example, the recommendation to include electronic copies of the orders on CD-ROM, so unit staff could modify the files and then print the unit-specific products, would hardly be risk-free. The tactical materials (OPORDS, overlays, message lists, decision support templates, synchronization matrixes, etc.) are all interdependent, and ensuring that they maintain proper alignment would demand significant effort and attention to detail. A "wizard" that draws templates from a TSP database and leads the unit trainer through required steps would appear sensible, but it would not guarantee completeness of modifications. Who would perform quality control checks of modified materials? Who would accept responsibility if flaws in modified products led to degraded training exercises? This area and possible solutions like the others in Table 32, merit further analysis and research to serve Army needs.

Janus Simulation Exercise

The Janus SIMEX (described in Section 2 of this report), while not a product of the FXXITP, was included in Brigade C's training schedule in place of the BSE. The BSE that had

been scheduled became infeasible due to the lack of access to the BBS. The assessment of the Janus SIMEX provides for a loose comparison between the acceptability, impact, and supportability of an exercise developed upon unfolding training requirements and the other products of the FXXITP that were developed for more general usage. Data on this product may also shed light on the potential for providing rapid-response training development support.

<u>Janus Simulation Exercise Acceptability</u>

Doctrinal currency was assessed by the primary and secondary training audiences (see Table 33). Only a third to a half of the primary training audience found the tactical materials (OPORDs, overlays, warning orders (WARNOs) and fragmentary orders (FRAGOs) consistent or totally consistent with current doctrine, while the corresponding figure for the Performance Objectives was 67%. On the other hand, 70% or more of the secondary training audience (battle captains, assistant staff officers, section NCOs) found all those TSP components consistent or totally consistent with current doctrine. Overall, these findings suggest (not surprisingly) that it is difficult to ensure doctrinal currency when reaction time is short.

Table 33
Perceptions of Doctrinal Currency of Janus Simulation Exercise Materials

Respondent Group Material	Inconsistent or Totally Inconsistent	Neither	Consistent or Totally Consistent	N
Primary Training Audience				
OPORD/Annexes	8 (62%)	1 (8%)	4 (31%	13
Overlays	3 (25%)	3 (25%)	6 (50%)	12
WARNOs/FRAGOs	5 (38%)	3 (23%)	5 (38%)	13
Performance Objectives	1 (11%)	2 (22%)	6 (67%)	9
Secondary Training Audience				
OPORD/Annexes	2 (18%)	1 (09%)	8 (73%)	11
Overlays	2 (18%)	1 (09%)	8 (73%)	11
WARNOs/FRAGOs	0	2 (18%)	9 (82%)	11
Performance Objectives	1 (12%)	1 (12%)	6 (75%)	8

Note. OPORD = operations order; WARNO = warning order; FRAGO = fragmentary order.

About half of the training audience participants (primary and secondary) reported they used the participant guide and the POs, while all participants used the division/brigade OPORD. Table 34 contains the responses of primary and secondary training audience members regarding how easily they were able to find information in their participant guides. Among the primary training audience, about half indicated it was easy to find information in the participant guide. About a third of the secondary training audience reported it was easy to find information in the guide. Participants were also asked about the extent to which the information and materials provided for the exercise established the conditions for successful training. Responses to this item were split among slight, moderate, and great extent. When asked about the acceptability of the amount of time spent on preparation for the Janus SIMEX, respondents in the primary training audience were generally positive, indicating the time was acceptable. The secondary

audience reported similarly. As shown later in this section, these ratings were similar to those made regarding the acceptability of the preparation time spent for the BBSE.

Table 34
Perceptions of Usefulness of Janus Simulation Exercise Materials

Questionnaire Item					
How easy to find information in guides by	Difficult or Very Difficult	Neither	Easy or Very Easy	Did not use	N
...Primary Training Audience	0	3 (20%)	4 (27%)	8 (53%)	15
...Secondary Training Audience	1 (8%)	3 (23%)	2 (15%)	7 (54%)	13
Extent to which materials establish conditions necessary for successful training	No Extent or Slight Extent	Moderate Extent	Great Extent or Very Great Extent		N
Primary training audience	5 (33%)	5 (33%)	5 (33%)		15
Secondary training audience	3 (25%)	5 (42%)	4 (33%)		12
Acceptability of the time required by the training	Totally Unacceptable or Unacceptable	Neither	Totally Acceptable or Acceptable		N
Primary training audience	2 (18%)	3 (27%)	6 (54%)		11
Secondary training audience	4 (13%)	3 (20%)	8 (53%)		15

Janus Simulation Exercise Impact

The perceived impact of the Janus SIMEX on the individual participants was not out of line with the perceived impact of other FXXITP products. Table 35 shows that more than half of the primary training audience respondents felt (to a great or very great extent) that the exercise enabled them to practice techniques they would use in battle. The corresponding figures for the secondary training audience dropped slightly to 39%. Among the primary training audience, 60% or more reported improvements (to a moderate extent or greater) in their task understanding, task performance, and teamwork skills job skills/abilities, and self-confidence. Among the secondary training audience, 70% or more reported the same improvements.

Table 35

Perceptions of the Impact of the Janus Simulation Exercise on Individual Users

Respondent Area of Impact	No Extent or Slight Extent	Moderate Extent	Great Extent or Very Great Extent	N
Primary Training Audience				
Enabled practice on battle techniques	3 (20%)	4 (275)	8 (53%)	15
Improved understanding of own tasks	5 (33%)	4 (27%)	6 (40%)	15
Improved own teamwork skills	1 (7%)	6 (40%)	8 (53%)	15
Improved ability to perform own tasks	6 (40%)	3 (20%)	6 (40%)	15
Secondary Training Audience				
Enabled practice on battle techniques	1 (8%)	7 (54%)	5 (38%)	13
Improved understanding of own tasks	2 (25%)	6 (46%)	5 (38%)	13
Improved own teamwork skills	1 (9%)	5 (45%)	5 (45%)	11
Improved ability to perform own tasks	3 (23%)	5 (38%)	5 (38%)	13

The great majority of primary and secondary training audience respondents felt that the Janus SIMEX contributed materially to the unit training program. Table 36 shows that 80% or more of the primary training audience and 100% of the secondary training audience reported that the exercise helped the brigade to (a) meet its staff training goals to a moderate extent or greater and (b) become better prepared for the LTP. Among both training audiences, 80% or more perceived that the brigade's combat readiness benefited from the Janus SIMEX to a moderate extent or greater. More than 75% of all respondents estimated that the exercise saved their unit substantial training time and funds.

Table 36

Perceptions of Impact of the Janus Simulation Exercise on the Unit

Respondent Area of Impact	No Extent or Slight Extent	Moderate Extent	Great Extent or Very Great Extent	N
Brigade Training Audience				
Help meet staff training goals	1 (7%)	4 (27%)	10 (67%)	15
Better prepare unit for Leader Training Program	3 (20)	3 (20%)	9 (60%)	15
Enhance unit combat readiness	3 (20)	2 (13%)	10 (67%)	15
Save unit training time	2 (13%)	4 (26%)	9 (60%)	15
Save unit training funds	1 (7%)	7 (50%)	6 (43%)	14
Task Force Training Audience				
Help meet staff training goals	0	5 (38%)	8 (62%)	13
Better prepare unit for Leader Training Program	0	4 (31%)	9 (69%)	13
Enhance unit combat readiness	1 (8%)	6 (50%)	5 (42%)	12
Save unit training time	3 (25%)	3 (25%)	6 (50%)	12
Save unit training funds	2 (17%)	1 (8%)	9(75%)	12

As Table 37 shows, most of the training audience respondents stated (to a moderate extent or greater) that their own unit should use the Janus SIMEX for future training and that other units should use the exercise as well. More than 75% estimated that the benefits outweighed the cost of the exercise.

Table 37
Perceptions of Future Utility of the Janus Simulation Exercise

Respondent Who Should Use	No Extent or Slight Extent	Moderate Extent	Great Extent or Very Great Extent	N
Brigade Training Audience				
Benefits outweigh costs	2 (13%)	5 (33%)	8 (53%)	15
Own brigade should use	2 (13%)	6 (40%)	7 (47%)	15
Other brigades should use	2 (13%)	6 (40%)	7 (47%)	15
Task Force Training Audience				
Benefits outweigh costs	2 (18%)	3 (27%)	6 (55%)	11
Own task force should use	2 (17%)	8 (67%)	2 (17%)	12
Other task force should use	2 (17%)	8 (67%)	2 (17%)	12

The next opportunity to assess the effects of the Janus SIMEX was at the end of the LTP. At that time, Janus SIMEX participants were asked questions regarding the impact of the SIMEX on their LTP performance. When asked about the effects on preparation time and effectiveness (e.g., provided LTP-relevant knowledge and skills), respondents provided mixed feedback. On all three items, however, more than 60% of respondents indicated the Janus SIMEX contributed (to a moderate or great extent) to preparation (see Table 38). Additionally, the LTP participants who had participated in the Janus SIMEX were asked about the extent to which their and other units should use the Janus SIMEX in preparation for the LTP. Of the 17 respondents, 88% of the unified training audience agreed their own unit should use the Janus SIMEX for future training in preparation for LTP, and the same proportion felt other units should use it as well.

The LTP participants were also asked for their perceptions of the overall impact of the Janus SIMEX on their LTP performance. The response was overwhelmingly positive (see Table 38), as 15 of 16 indicated the Janus SIMEX had been beneficial or very beneficial and one respondent indicated the SIMEX was neither harmful nor beneficial.

Table 38

Perceptions of Impact of the Janus Simulation Exercise on Unit Leader Training Program
Performance

Area of Impact	No Extent or Slight Extent	Moderate Extent	Great Extent or Very Great Extent	N
Enabled unit to use preparation time more effectively	4 (27%)	5 (33%)	6 (40%)	15
Saved unit preparation time for the LTP	4 (29%)	3 (21%)	7 (50%)	14
Provided LTP-relevant knowledge and skills	5 (33%)	1 (7%)	9 (60%)	15
Own brigade should use	2 (12%)	5 (29%)	10 (59%)	17
Other brigades should use	2 (12%)	6 (35%)	9 (53%)	17
	Very Harmful or Slightly Harmful	Neutral	Beneficial or Very Beneficial	N
How Janus SIMEX affected LTP performance	0	1 (6%)	15 (94%)	16

Note. LTP = leader training program; SIMEX = simulation exercise.

Before their NTC rotation, the brigade participated in an implementation of the BBSE. Following that implementation, brigade and task force staff estimated the extent to which the Janus SIMEX had helped them prepare for the BBSE. Results, presented in Table 39, were positive as 85% indicated that the Janus SIMEX had been helpful (to a moderate or great extent) in BBSE preparation.

Table 39

Perceptions of the Impact of the Janus Simulation Exercise on Brigade and Battalion Staff
Exercise Performance

Respondent	No Extent or Slight Extent	Moderate Extent	Great Extent or Very Great Extent	N
Brigade staff	1 (13%)	2 (25%)	5 (62%)	8
Task force staff	2 (15%)	7 (54%)	4 (31%)	13

After the brigade's NTC rotation, Janus SIMEX participants were asked for their perceptions of the overall impact of the Janus SIMEX on their NTC performance. As shown in Table 40, despite the low response rates, the ratings were generally positive from the brigade level training audience, and ambivalent from the task force respondents.

Table 40
Perceptions of the Impact of the Janus Simulation Exercise on National Training Center Performance

Respondent	Harmful or Very Harmful	Neither	Beneficial or Very Beneficial	N
Brigade staff	1 (25%)	0	3 (75%)	4
Task force staff	0	3 (75%)	1 (25%)	4

Janus Simulation Exercise Supportability

The end-of-SIMEX questionnaires asked the training audience whether the ISAT team support (tactical and Janus experts performing many of the exercise functions) was necessary or not. As seen in Table 41, all of the primary training audience respondents and about two-thirds of the secondary training audience judged that the external support was necessary. This underscores the importance of on-site personnel who understand the TSP intimately when quick-reaction exercises are crafted to meet unexpected unit training needs.

Table 41
Perceptions of the Necessity of the Support Provided for the Janus Simulation Exercise

Respondent Measure	No Extent or Slight Extent	Moderate Extent	Great Extent or Very Great Extent	N
Primary Training Audience				
Extent to which ISAT team was needed	0	0	13 (100%)	13
Extent to which Janus staff was needed	0	0	13 (100%)	13
Secondary Training Audience				
Extent to which ISAT team was needed	0	3 (38%)	5 (62%)	8
Extent to which Janus staff was needed	0	2 (33%)	4 (67%)	6

Brigade and Battalion Staff Exercise

The BBSE was conducted only once under the auspices of the project, by Brigade C, midway between their LTP visit and their NTC rotation. The data presented here were gathered during and after the BBSE implementation, and after the NTC rotation itself.

Brigade and Battalion Staff Exercise Acceptability

Table 42 summarizes the perceptions of the training audience and support personnel regarding the doctrinal consistency of various BBSE training materials. The brigade staff training audience respondents gave the key materials consistently high marks (89% to 100% reporting that the materials were doctrinally correct); while generally positive, the task force participants' ratings were somewhat lower (65% to 80% reported that the materials were doctrinally correct).

Table 42

Perceptions of the Doctrinal Currency of Brigade and Battalion Staff Exercise Materials

Respondent Material	Inconsistent or Totally Inconsistent	Neither	Consistent or Totally Consistent	N
Brigade Training Audience				
Operation order/annexes	0	0	9 (100%)	9
Overlays	0	0	9 (100%)	9
Initial situation package	0	1 (11%)	8 (89%)	9
WARNOs/FRAGOs	0	0	9 (100%)	9
Performance objectives	0	0	6 (100%)	6
Task Force Training Audience				
Operation order/Annexes	2 (13%)	1 (7%)	12 (80%)	15
Overlays	1 (7%)	2 (13%)	12 (80%)	15
Initial situation package	2 (14%)	3 (21%)	9 (65%)	14
WARNOs/FRAGOs	1 (6%)	3 (19%)	12 (75%)	16
Performance objectives	1 (7%)	2 (14%)	11 (79%)	14

Note. WARNO = warning order; FRAGO = fragmentary order.

Likewise, observers' ratings of the PO materials were consistently high. Between 67% and 87% of the BLUFOR roleplayers and interactors as well as EXCON personnel rated the tactical materials and job aids as consistent or totally consistent with Army doctrine. Even though the BBSE was the newest of the FXXITP products, these results suggest that the lag time between development and field implementation of structured TSPs is sufficient to introduce discrepancies as Army doctrine continues to evolve.

Only 8 of 28 training audience members (29%) who responded to the questionnaire reported that they used their Training Audience Guides (see Table 43). Of those eight, half reported that it was easy to find information in the guides, and half said it was neither easy nor difficult. Several of them commented that they did not have time to read all the TSP materials. Other participants (i.e., observers, roleplayers, interactors, EXCON personnel) were more likely to report reading their guides: Of 36 respondents, 26 (72%) reported that they used their respective guides, and 22 (85% of those who used their guides) said that finding information in the guides was easy or very easy.

Table 43

Perceptions of Usefulness of Brigade and Battalion Staff Exercise Materials

Respondent	Difficult or Very Difficult	Neither	Easy or Very Easy	Did not use	N
How easy to find information in guides by					
...Brigade Training Audience	0	2 (20%)	2 (20%)	6 (60%)	10
...Battalion Training Audience	0	2 (11%)	2 (11%)	14 (78%)	18
...Observers	0	1 (20%)	3 (60%)	1 (20%)	5
...Roleplayers and Interactors	0	1 (8%)	5 (42%)	6 (50%)	12
...EXCON Personnel	0	2 (10%)	14 (74%)	3 (16%)	19

Note. EXCON = exercise control.

At the procedural level, three-fourths of the EXCON personnel found it easy or very easy to send scripted messages and monitor OPFOR activities, while half to two-thirds reported the same for issuing and briefing orders, answering the brigade staff's questions, moving division/corps assets; and controlling division/corps CSS functions. Only about half of the EXCON personnel reported attending BBS training, as the TSP recommended. The great majority of them felt BBS training was essential, with 75% recommending (to a moderate extent or greater) basic or additional BBS training.

Comments of the participants pointed to a number of improvements in the tactical materials of the BBSE TSP. These merit consideration in future efforts to improve and expand the FXXITP utility and impact. The recommendations are summarized in Table 44.

Table 44

Summary of Recommended Brigade and Battalion Staff Exercise Enhancements

Area
    Recommendation

Tactical Materials
- Scrub the Intelligence Annex to accurately reflect current division capabilities.
- Revamp the initial intelligence estimate to provide more specific information and eliminate inconsistencies (e.g., early warning priorities should match division collection capabilities).
- Add personnel annexes to the family of OPORDs.
- Expand the sketch map for the first mission into a full Situation Template.
- Build greater diversity into the combat mission dynamics. For example, avoid the BLUFOR always attacking through the most restrictive terrain.
- Improve the Intelligence Summaries by making them more regular (e.g., every six hours) and incorporating actual exercise developments in them.
- Modify the timeline for the reconnaissance battle to make it more realistic.
- Expand the TSP materials for engineer elements.
- Add Army Airspace Command and Control (A2C2) materials, to include an A2C2 annex and overlay as well as appropriate job aids (checklists, planning guides, etc.).

table continues

Table 44 (continued)

Area

Recommendation

- Improve the division air defense artillery (ADA) Annex to make it mission-focused, to include high/medium range air defense coverage parameters.
- Expand the number of division-level events requiring the brigade to process and analyze information.
- Improve the replication of U.S. Air Force processes and products.
- Strongly encourage communication channels linking ADA assets with brigade and task force TOCs.

Performance Assessment and Feedback Procedures

- Provide focused training modules for observers to ensure more comprehensive, consistent performance measurement and AARs.
- Include instructions for coaching as well as desired AAR procedures.
- Put the observers on a rotating schedule inside the CPs to help cut down the CP traffic, but sufficient observation opportunities would need to be protected.
- Include the battlestaff NCOs in the AARs even though they are not part of the formal training audience.
- Provide a take home package to provide the unit a compendium of feedback to study later.
- Give observers an administrative net (via hand-held radios) to share information and coordinate activities.

Procedures for Roleplayers and Interactors

- Provide explicit TSP instructions regarding shift change briefing procedures for the benefit of personnel manning the simulation workstations. Some BLUFOR roleplayers and interactors indicated they experienced confusion following shift changes. While these procedures should be contained in the unit's current standing operating procedures (SOP), the simulation exercises are just foreign enough to warrant more explicit guidance.

Exercise Control (EXCON) Guidance

- Provide a high-level exercise overview, including the TOC-Battle Simulation Center linkage and the BBS implementation concept.
- Include call signs for out-of-sector units.
- Use the NTC Standing Operating Procedure (SOP) for reporting.
- Provide an integrated matrix listing BLUFOR events, linked to scripted message numbers.
- Include a practical exercise as part of their pre-exercise train-up.

Performance Objective Additions

- Include RSOI requirements. The first mission, for example, could begin with RSOI tasks that would transition to force-on-force activities. The RSOI activities would emphasize building combat power, establishing the base for definitive combat action. High-value tasks would include drawing combat equipment, assessing the status of equipment and personnel, organizing the staging base, establishing CPs, and maintaining reception area security.

Note. OPORD = operation order; BLUFOR = Blue Forces; TSP = training support package; ADA = air defense artillery; TOC = tactical operation center; AAR = after action review; CP = command post; NCO = noncommissioned officer; BBS = Brigade/Battalion Battle Simulation; SOP = standing operating procedure; RSOI = reception, staging, onward movement, and integration.

Brigade and Battalion Staff Exercise Impact

As seen in Table 45, nearly all (90%) of the brigade respondents felt (to a great or very great extent) that the exercise enabled them to practice techniques they would use in battle. The corresponding figure for the secondary training audience was somewhat lower (63%) but only one respondent was negative (5%). Additionally, the majority (80% or more) of the brigade-level and task force-level training audiences perceived that their individual understanding and abilities had improved to a moderate extent or greater. It is notable that 100% of both training audience samples felt their own teamwork skills had improved at least moderately, with 84% or more indicating this specific improvement to a great or very great extent. These combined results indicate that the bulk of the training audience perceived the relevance of the BBSE training.

Table 45
Perceptions of Impact of the Brigade and Battalion Staff Exercise on Individual Users

Respondent Area of Impact	No Extent or Slight Extent	Moderate Extent	Great Extent or Very Great Extent	N
Brigade Training Audience				
Enabled practice on battle techniques	0	1 (10%)	9 (90%)	10
Improved understanding of own tasks	1 (10%)	3 (30%)	6 (60%)	10
Improved ability to perform own tasks	1 (10%)	2 (20%)	7 (70%)	10
Improved own teamwork skills	0	1 (10%)	9 (90%)	10
Task Force Training Audience				
Enabled practice on battle techniques	1 (5%)	6 (32%)	12 (63%)	19
Improved understanding of own tasks	2 (11%)	9 (47%)	8 (42%)	19
Improved ability to perform own tasks	2 (11%)	9 (47%)	8 (42%)	19
Improved own teamwork skills	0	3 (16%)	16 (84%)	19
Observers				
Improved brigade staff proficiency	1 (25%)	0	3 (75%)	4
Improved task force staff proficiency	1 (25%)	1 (25%)	2 (50%)	4
Improved staff members' teamwork skills	0	2 (40%)	3 (60%)	5

As Table 45 shows, the external observers' perceptions of performance-related improvements reinforced those of the training audience. Three of the four respondents felt that staff proficiency had improved, and four of five respondents reported improvements in staff teamwork skills.

As shown in Table 46, all of the brigade-level training audience and nearly all of the task force-level training audience perceived that the BBSE helped meet unit training needs to a moderate extent or greater. This included enhancing combat readiness.

Table 46

Perceptions of Impact of the Brigade and Battalion Staff Exercise on the Unit

Respondent Area of Impact	No Extent or Slight Extent	Moderate Extent	Great Extent or Very Great Extent	N
Brigade Training Audience				
Help meet staff training goals	0	3 (30%)	7 (70%)	10
Pave way for follow-on training	0	3 (30%)	7 (70%)	10
Better prepare unit for National Training Center	0	2 (20%)	8 (80%)	10
Enhance unit combat readiness	0	3 (30%)	7 (70%)	10
Save unit training time	1 (10%)	3 (30%)	6 (60%)	10
Save unit training funds	1 (10%)	4 (40%)	5 (50%)	10
Task Force Training Audience				
Help meet staff training goals	0	7 (37%)	12 (63%)	19
Pave way for follow-on training	1 (5%)	4 (21%)	14 (74%)	19
Better prepare unit for National Training Center	1 (5%)	4 (21%)	14 (74%)	19
Enhance unit combat readiness	3 (16%)	5 (26%)	11 (58%)	19
Save unit training time	5 (26%)	5 (26%)	9 (47%)	19
Save unit training funds	4 (21%)	3 (16%)	12 (63%)	19

As Table 47 shows, 75% or more of both training audience samples estimated the exercise saved their unit substantial training time and funds, with benefits solidly outweighing costs. Additionally, all of the brigade staff respondents and nearly all of the task force respondents believed (to a moderate extent or greater) that their own unit should use the BBSE for future training and that other units should use the exercise as well. The external observers' responses strongly reinforced those of the training audience. Thus, the actual and potential contributions of the BBSE to the unit's training program received quite favorable marks.

After the NTC, members of the training audience were asked for their perceptions of the overall impact of the BBSE on their NTC performance. The responses on questions of whether their own or other units should use the BBSE were generally positive, and more positive among brigade staff respondents than task force respondents (Table 48).

Table 47
Perceptions of the Future Utility of Brigade and Battalion Staff Exercise

Respondent Who Should Use	No Extent or Slight Extent	Moderate Extent	Great Extent or Very Great Extent	N
Brigade Staff				
Benefits outweigh costs	0	4 (44%)	5 (56%)	9
Own brigade should use	0	3 (30%)	7 (70%)	10
Other brigades should use	0	3 (30%)	7 (70%)	10
Task Force Staff				
Benefits outweigh costs	1 (6%)	5 (29%)	11 (65%)	17
Own task force should use	2 (11%)	5 (28%)	11 (61%)	18
Other task force should use	2 (11%)	3 (17%)	13 (72%)	18
Observers				
This brigade should use	0	3 (60%)	2 (40%)	5
Other brigades should use	0	2 (40%)	3 (60%)	5

Table 48
Perceptions of the Future Utility of the Brigade and Battalion Staff Exercise for Sustaining Proficiency

Measure Respondent	No Extent or Slight Extent	Moderate Extent	Great Extent or Very Great Extent	N
Own brigade or task force should use to sustain proficiency				
Brigade Staff	0	1 (25%)	3 (75%)	4
Task force Staff	0	5 (62%)	3 (38%)	8
Other brigades or task forces should use for National Training Center Preparation				
Brigade staff	0	1 (25%)	3 (75%)	4
Task forces staff	0	6 (75%)	2 (25%)	8

As shown in Table 49, despite the low response rates, the ratings of the benefits of BBSE participation in terms of NTC performance were entirely positive from the brigade-level training audience, and somewhat lukewarm from the task force respondents.

Table 49
Perception of the Impact of the Brigade and Battalion Staff Exercise on National Training Center
Performance

Respondent	Harmful or Very Harmful	Neither	Beneficial or Very Beneficial	N
Brigade staff	0	0	4 (100%)	4
Task force staff	0	3 (43%)	4 (57%)	7

Brigade and Battalion Staff Exercise Supportability

There were quite a few observations from surge team members and comments from BBSE participants that address the supportability of the BBSE. They concern personnel, time, and T3 issues. The observations and comments are summarized below.

The BBSE TSP recommends that brigades designate a Combined Arms Operations at Brigade Level, Realistically Achieved Through Simulation (COBRAS) Coordinator to plan and manage the preparation for each exercise. Both brigades participating in this assessment tasked an Assistant S3 to serve as their coordinator for the preparation/execution of the BBSE. With numerous other duties, these key support personnel found it difficult to devote sufficient time to coordinating all of the BBSE preparation activities. In addition, the rapid start-up of the ISAT project constrained the planning environment, giving the units little lead time to adjust training calendars that had been established months before. The combination of time constraints and competing demands left the unit coordinators with minimal time to become thoroughly familiar with all of the BBSE materials and make informed decisions about how to use them to meet unit training needs. This situation often led to last-minute actions and abbreviated preparations for collective events, in effect detracting from the full training value achievable by proper use of the various products.

To maximize the utilization of the products, ISAT provided support personnel to assist the participating units, as discussed in Section 2. The on-site TSCs and surge teams played key roles throughout the course of the assessment. In addition, BBSE developers made up the surge team that conducted start-up training. The anecdotal evidence indicates strongly that the external support was critical to the limited implementation that was possible.

For each participating brigade, ISAT members conducted all start-up training (FXXITP orientation, product familiarization, and T3 sessions) in this limited implementation. For Brigade C, for example, the following on-site schedule was executed: product overview, 40 minutes; BSTS overview, 20 minutes; and vignette orientation and workshop, 55 minutes. Team members felt these were minimum essential times, and recommended additional time for the BSTS overview whenever BSTS orientation and hands-on training are scheduled separately. The ISAT members were able to use outline and briefing slide materials successfully because they were thoroughly familiar with the products as a result of working on the development teams. However, their feeling was that unit personnel (e.g., the COBRAS Coordinator) would not have been able to conduct this training without an expanded program of instruction, to include scripts and audiovisual materials.

Duplication and distribution of training materials for the BBSE in this assessment fell short of the scheme called for in the TSP. Several features of the training environment (e.g., time constraints, competing demands, over-committed personnel) explain most of the difficulties in distributing essential materials. The ubiquitous nature of these environmental features points to a pressing need to explore alternative means for distributing normally printed training materials.

For the BBSE, the TSPs call for key support personnel, to include the Exercise Director, observers, the OPFOR Controller, BLUFOR roleplayers and interactors, and EXCON. In contrast to the vignettes and the Janus SIMEX, these roles were, for the most part, filled by appropriate personnel from the division and a sister brigade. As a result, the BBSE was successfully executed, with positive comments and questionnaire responses from the audience and observers.

Summary

This section has presented results of the data collection efforts throughout the course of the project. In addition to continuous observations of units' efforts to utilize the FXXITP products (often in the face of competing demands on resources), there were several formal data collection opportunities. At each of these opportunities, we attempted to assess attitudes concerning all the products that had been used earlier. The result was a long retrospective look at the perceived utility of the products.

However, because only one brigade was able to follow through with use of most of the products, the number of respondents to questionnaires was low. Another situation that affected the amount of data was the loss of BSTS data due to technical difficulties.

Nonetheless, the data reported here reveal some general trends in reactions to use of the product. Those trends are discussed in terms of lessons learned in the following section.

Section 5. Lessons Learned

The work performed during the ISAT project revealed a wide range of issues concerning the implementation of the FXXITP products as well as the support and assessment conducted by the project team. This section discusses those issues from the perspective of lessons learned during the project and recommendations that emerged in discussions with members of the participating units. As were the results, the lessons are grouped in three areas: acceptability (including usability), perceptions of impact, and supportability. A final lesson addresses training effectiveness assessment itself.

Acceptability

During this assessment acceptability was defined as "...the unit's acceptance of the FXXITP products as being doctrinally correct and containing usable materials." Questions that were addressed included: Were the training materials doctrinally correct? Were they usable? Were other materials necessary?

The acceptability of the FXXITP products was, for the most part, positive. BSTS users indicated that the BSTS met the basic needs for individual staff level training, although it was not sufficiently interactive. The vignettes were perceived as sufficiently flexible for use in learning centers, in the field, or for "Thursday morning" (staff development) training. The BSTS and BSE were found by 7ATC reviewers to be the least current of the products. Most felt that the products supported the training they were intended to support. Yet many comments indicated that there were changes that needed to be made to make the products more useful and keep them viable.

Lesson: *Structured training products will inevitably become outdated, and will require continual examination and updating.*

It took over five years to develop, implement, and assess the FXXITP products. Because Army doctrine has continued to evolve, some of the products are currently outdated, doctrinally and technologically. As stated in Section 4, most of the shortcomings of the FXXITP products deal with doctrinal changes to terms and symbols, with some changes to tactics, techniques, and procedures, and newer ways to deliver information. This is an inevitable occurrence for any structured training product, and underlies one of the reasons that the program must have Army wide support (as described in a later lesson).

Lesson: *Even though it is inevitable that the products will become outdated, they can be used while updating goes on.*

Despite the doctrinal shortcomings of the products, the units were still able to use the products for training, and after their LTP, indicated that the training had been useful. For example, reviewers of the BSTS from the project, user units, and 7ATC identified many instances of outdated doctrine; yet users of BSTS were consistently positive regarding the doctrinal currency of the BSTS courses.

When asked about the apparent discrepancy, one reviewer said that the fighting units were more likely to overlook doctrinal inconsistencies if the potential training benefit was high. In other words, they cared more about learning to fight well than how they learned how to fight well. Perhaps these units, who train and are prepared to fight, are less concerned about meticulous consistency with all the points of doctrine than are people involved in the development and teaching of doctrine. That is, when Brigade C commented on the value of the BSTS, they were more interested in the potential benefit the training could offer than the small discrepancies in doctrine. They tended to overlook doctrinal inconsistencies.

While doctrinal consistency is critical, it may be that intermittent updates, and not a continuously ongoing revision process, are good enough. The fact is that (as stated in the previous lesson) all structured training products that are tied to doctrine will become outdated as doctrine changes. But the Army, or TRADOC, or the FXXITP, should find a way to distinguish between doctrinal inconsistencies that lead to bad training, and those that are below the noise level. They should avoid the situation where any and all instances of doctrinal outdated graphics or language can cause the distribution and usage of products to be delayed. It seems apparent that training units are willing and able to overlook flaws of products if those products are

perceived to be good training products. One comment from a BBSE participant indicates that doctrinal currency may not be paramount: "[It is doctrinal], but not what the NTC did to me when we were there six months ago."

The thrust of the participant reactions is that, in the short run, the FXXITP products can meet the training needs despite their doctrinal shortcomings. However, units will quickly become tired of training with outdated products and will either quit using them or be required to update the products themselves. If the units quit using them or have to update the products themselves, the Army will have lost all of the advantages of standardized and structured training. To ensure that these products remain viable to the unit while remaining standardized and structured, program resources should be allocated to gather feedback on these products, review them for currency, and update them in a timely manner. The force should be kept informed of the updating intentions and progress.

One way to facilitate the maintenance of doctrinal currency would be to use the same products for institutional training. By doing so, the training institutions (who are also responsible for updating doctrine) will by the nature of their institutional training requirements focus on product currency. This also provides an advantage of more widespread understanding of the products, since unit leaders will have used them during their institutional training.

Lesson: Future TSPs can be more usable if we incorporate more of the human dimensions of TSP usage.

A consistent concern expressed about use of the FXXITP products was the size of the TSPs. Because of the intricate structures of the programs, the TSPs for all of the products are lengthy, and require some practice to navigate. Even with TSCs, surge team assistance, and T3 sessions, the sheer appearance of complexity was daunting. Many participants indicated that they did not use their materials. Unit trainers commented that it was difficult to reproduce, distribute, and explain the contents of the materials. The data (or rather, the lack of data) indicated clearly the prevalence of problems with training management components that often left unit leaders only partially aware of product options and value, and lacked safeguards to prevent loss of data (BSTS courses).

Such findings indicate the products did not fully meet the working needs of the training audience. One likely cause of this circumstance lies in the nature of the requirements analysis that is performed when structured training products are developed. Developers have not yet identified effective ways to address training constraints with the same expertise that is applied to task-based training needs. The design-oriented phases focus heavily on product content, scenario context, and simulation characteristics. However, developers have not yet been able to incorporate what is known about knowledge engineering and the constraints of the training environment. Adjusting the design process to bring the human dimensions of TSP usage into closer balance with training objectives and technology considerations could lead to products that make the information easier for the users to access and reduce the burden of getting ready to train.

The methodologies that emerged from early structured training development research (C. H. Campbell, Campbell, Sanders, Flynn, & Myers, 1995; C. H. Campbell & Deter, 1997; C. H. Campbell, Ford, Campbell, & Quinkert, 1998) call for analysis of staffing requirements, training audience characteristics, training environment characteristics, and human factors aspects of training products. As yet, no controlled study of the effectiveness of different TSP approaches has been attempted. Such considerations may provide a substantial payoff to both training developers and researchers.

This may indicate a need to reexamine the entire implementation model. It is easy to say that we must streamline the presentation of materials and minimize the load imposed on the trainers and training audience. At the same time, it is imperative that crucial information (e.g., training objectives, definition of training audience versus support personnel, specific assignments) be disseminated in advance, and that all necessary information and guidance that defines the product structure be available. Failure to provide clear information in advance inevitably leads to confusion about the exercise's purpose, roles and duties, which in turn degrades the event's training value. Failure to provide materials that guide the conduct of the exercise causes exercise support personnel to make their best guess about how to allow events to unfold, which breaks the link between the training and the tasks that are to be trained.

Developers of structured training products have expressed frustration with the lack of complete use of TSP materials for years (C. H. Campbell, Graves, et al., 1998; C. H. Campbell et al., 1999; Graves et al., 1997). Each new development attempts to provide for more user-friendly TSPs, yet we have not yet been able to crack the code on user needs. We have simply not been able to comprehend the obstacles and incorporate effective solutions. The answer is not a simple one. It is likely to be a combination of additional research on what works for time-stressed units, Army and command emphasis on use of the products, and the availability of surge teams or support coordinators.

Lesson: There needs to be a balance between the time allotted to prepare for these exercises and the time it takes to prepare.

These FXXITP products are not advertised as "turn-key" training, which would convey a design characteristic that is supposed to enable the training coordinators to implement the training products with minimal preparation. Nonetheless, unit training coordinators rarely allocate sufficient time for preparation. Time has proven to be the most valuable commodity to the units participating in this assessment, and is probably equally valuable across AC and RC units. As a general rule, personnel did not study the guides or accomplish preparation activities in accordance with the TSP instructions. It is easy for us to blame the TSPs when in fact it may be that the unit isn't providing enough time to prepare for training.

Lesson: In addition to doctrinal updates, TRADOC and the FXXITP should continue to incorporate technology updates.

This lesson emerged as the team observed BSTS and BBSE implementation. Units in this assessment used BSTS courseware in stand-alone mode. However, the courses were designed primarily for a LAN operating environment. This is not the LAN environment we are used to

using today, but a hard-wired Ethernet LAN that was commonplace in 1993. Similarly, the BBSE was originally written for a version of BBS software that was no longer being used at the time of implementation. The ISAT team assisted the simulation center personnel with the updating to allow the exercise to occur. This shows a need to validate assumptions about infrastructure in place when products are ready for fielding. Although a comprehensive systems approach builds infrastructure in parallel with course development, the technology needs to be reexamined continually, just as do doctrinal foundations.

Lesson: TRADOC and the FXXITP should continue to develop ways for units to tailor TSP materials to their unit's organization and equipment, training audience, and SOP.

This lesson addresses a range of issues that attack the advantages of structure and standardization, balanced against the need for programs that are flexible enough for valuable training. Allowing units to tailor tactical materials is relatively simple in the vignettes, but becomes more complex in the BSE and BBSE, and extremely difficult in the BSTS. Except for the BSTS, TSPs could be provided in an electronic form so that the unit can modify the unit information to match their own. Another option would be to deliver these TSPs in a manner consistent with the Commander's Integrated Training Tool (Gossman et al., 1999) This computer- and Internet-based system, currently under development by ARI and Simulation Training and Instrumentation Command, is designed to help units use existing TSPs as written, modify them for their own situations, or develop new TSPs.

The current approach of designing structured TSPs to be used by a diverse mix of tactical units makes development a viable process, but the one-size-fits-all approach asks unit personnel to adopt alter-identities, notional equipment mixes, and so on. On the other hand, the desire to replicate exactly the unit's organization, equipment, signal operations instructions, tactical SOP, and other operational conditions is understandable, but there are no data showing that precise replication increases training value or transfer of training. Research to evaluate this dimension, as well as to find ways to make the products more flexible, would help determine if the Army should invest in unit-specific TSPs.

In addition to the desire to tailor the organizational information, the units participating in this assessment consistently modified preparation and execution procedures specified in the FXXITP TSPs. Abbreviated preparation activities, training audience changes, altered missions, scheduling peculiarities, self-generated performance assessment and AAR procedures, and numerous other alterations were common. This indicates that, even with structured training products, standardization is difficult to achieve. More to the point, it highlights the importance of designing TSPs to provide substantial execution flexibility. For example, the vignette training audience was typically expanded by the unit, but the "extra" participants found no specific TSP materials for themselves. The TSP could include instructions for integrating extra participants and outfitting them with relevant training materials.[5] The design process should take into

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[5] The reader should notice at this point the insidious subtlety of "good idea creep;" every such good idea increases the bulk of the TSP, and we have yet to discover how to include the many good ideas without complicating TSP delivery even further.

account the likely variations in utilization, and the evaluation process should incorporate program flexibility as a major dimension of interest.

The single implementation of the BBSE is a case in point. The product was altered significantly to meet the unit's perceived training needs in preparation for an NTC rotation. Yet the BBSE exercise director, the installation's deputy commanding general, pointed out that "If we had to generate this exercise on our own, given our organization and other requirements, we would not have done as well. Overall, I think the content of this TSP is very good, the concept is good."

Perceptions of Impact

Impact, in this research, included issues of learning, job performance, and organizational impact. Questions of interest included: Were the training products useful for learning and practicing job requirements and preparing for other major training events? Did users think that the training had (or would have) a positive effect on performance? Most of the responses from users indicated that they saw the potential training value of the products. After the LTP experience, the Brigade C members said that the products had helped them prepare; after the NTC rotation, their comments showed that they were beginning to see some value in the products. Many of the answers to these questions focused less on the existing products than they did on what was still needed—a subtle tribute to the perceived training impact.

Lesson: The existing products need to be expanded.

The call for additional expanded products came mostly on the BSTS and vignettes. On the BSTS, users requested courses for their staff section members as well as for the staff officers. While there are cases where staff officers have used the BSTS courses for their sections, specific courses would provide the information and training that NCOs need.

On vignettes, they commented that brigade staff vignettes are not enough. The units also need vignettes for battalion staffs, for brigade leadership, for leaders linked from brigade through company and for commanders and their staffs. The so-called "Leader Vignettes" are needed to ensure that all staff section leaders and commanders within the brigade combat team can develop a common understanding of the brigade commander's intent and information needs. The multiechelon leader vignettes would help the subordinate commanders understand the amount and type of detail the brigade commander needs to make a decision. These would likely be closely associated with the commander's critical information requirements and Decision Support Template. The goal of these vignettes would be to provide a concrete experience (adult learning model start point) from which the participants could discuss the "art" of warfighting. Similarly, the commander-staff vignettes would bring the key leaders of the staff into the process where the staffs add clarity to the information provided by the commanders because they have the time to analyze the information. One user explained that the outcomes of the vignettes for leaders should be staff recommendations for commanders; the vignette should train staff leaders to analyze the right amount of information quickly.

Supportability

Supportability of the products referred to whether a brigade would be able to conduct the FXXITP exercises within the resources available to them. The key question was: What would it take to make the training products useable within a brigade's training plan? In this regard each component of the FXXITP had to be evaluated for supportability based on the requirements established for its use, as laid out in the TSP.

The experience on this project would indicate that all of the assessed components of the FXXITP require external support for unit use. The amount of support will vary. For the BSTS, both system installation and initial use training were provided, and were later supplemented with continuing assistance in recording usage data and keeping the systems running. The support for the vignettes was relatively slight, involving only initial training for the unit personnel. For the more complex elements, the Janus SIMEX (which served as stand-in for the BSE) and the BBSE, the project surge team was in great demand. The Janus SIMEX was anomalous: the project team prepared the TSP with full expectation of providing a great deal of implementation assistance. But the BBSE, with its relatively comprehensive TSP, also called for significant surge team efforts.

The five lessons stated below address three aspects of supportability.

Lesson: The program and its products will require Army-wide support in order to be resourced and used.

One of the biggest concerns of the personnel using the products was the level of support given to the FXXITP and the products of the program Army-wide. Without the proper emphasis from the Army chain of command, most participants felt that the products and the training they were intended to support would not be understood, included in training strategies and plans, or resourced.

In order for the FXXITP to be institutionalized, support for the FXXITP must start at the DA level and must be supported by each major command that will use the products. As one brigade commander said, "The Force XXI Training Program must be endorsed by the Army, not just by individual units." The TRADOC must not only support the program to ensure that personnel attending TRADOC schools understand the program and how to use the products, TRADOC must also be prepared to maintain the program and its products to ensure their continued viability and usefulness to the units in the field. The FORSCOM must support the program by establishing a training strategy that helps units understand how to incorporate these products into their training plans, and must also incorporate requirements for the training into FORSCOM Regulations 350-1 and 350-2 (DA, 1998a, 1998b).

The products cannot simply be added as additional training requirements. They must replace existing but less efficient or effective training. One commander queried "What can I take off my plate in order to do this?" Organizations like the Combat Training Centers (CTCs) must understand the purpose of the FXXITP and its products so they can provide recommendations to

units on which FXXITP product they can train with to overcome problems identified during LTP training and CTC rotations.

Thus, despite what was in many cases a good understanding of the products and acceptance that the FXXITP products could help them, not all commanders were able to use these products in lieu of other training events required by FORSCOM and installation training regulations. This seems to have been primarily because the program was a TRADOC initiative and not a DA and FORSCOM supported program.

Lesson: A formal program of education and orientation should be implemented to explain the FXXITP products to the installation and brigade leadership, future leaders, and training institutions.

Throughout the duration of the project, there were questions about the purpose of the FXXITP and its products. Even though initial orientation briefings and product T3 sessions were conducted at both user unit installations, the chain of command at both installations admitted that they never really understood the products as well as they should have. Likewise, the NTC personnel had concerns about the products that showed an incomplete understanding of the product intent, the product purpose(s), and the Army expectations regarding the use and support of the products by the NTC operations group.

One common problem observed throughout the project dealt with a unit's inability to understand and implement the products available to them through the FXXITP. The initial concept for all of the FXXITP products was that they would be fully exportable, a concept that was invalidated during the trials of most of the products (C. H. Campbell, Graves, et al., 1998; C. H. Campbell et al., 1999; Graves et al., 1997). To help offset this the ISAT team conducted initial orientation briefings for the installation and brigade leadership. These orientation briefings gave these leaders a basic understanding of the FXXITP and the intent for each product but did not walk the leadership through the components of each product. In addition to the initial orientation briefings, the ISAT team developed and conducted a T3 course and provided the unit with a supporting guide for the BSTS and vignette products. The ISAT team also assisted the unit during the preparation and train-up phases of the BBSE exercise. Yet, as stated above, misunderstandings continued.

In a separate effort, the ISAT team conducted a more comprehensive orientation session with representatives of 7ATC. Over a two-day period, the ISAT team provided a hands-on orientation of the BSTS, vignettes, BSE, and BBSE products. During the BSTS and vignette orientations, the ISAT team used the previously developed T3 course and supporting guide and then developed a storyboard for walking the 7ATC representatives through each component of the BSE/BBSE. This education and orientation effort was felt to be very successful, yet it was not tied to a specific implementation schedule. Rather, the 7ATC representatives requested the orientation for their own information and evaluation. Perhaps the key to success is in the motivation of the recipients—whether they are participating because they want the information, or because they are feeling pressured to add yet more briefings to an already overburdened schedule.

Lesson: A formal program of maintenance should be instituted to ensure that these products remain current and viable.

One of the biggest complaints by the participating units was that the products were outdated. While this is likely to occur eventually for all training products being delivered to the force, the force should be able to expect that this problem is only a temporary condition. In the case of the FXXITP products, there is a DTDD effort, currently ongoing, to update the FXXITP products.

The wider lesson applies to products besides those evaluated in this project. All structured training development (which is, by definition, training that is tied to doctrinal task performance) should have a built-in plan for maintenance. As described earlier, maintenance plans for simulation- or computer-based training should also include considerations of updating the projects in synchronization with technological advances.

Lesson: A formal program of sustainment and support should be instituted to ensure that units are able to adapt the products as needed and implement them with minimal disruption to unit ongoing requirements.

After concerns about doctrinal currency, the next most frequent request was for products that could be tailored to unit needs and situations. A plan for sustainment of the products could include surge teams that assist first-time users or help with modifications to products to meet unit training needs. Lower cost off-site assistance could be offered by means of a hot line or help desk and a web page for disseminating information.

Lesson: If BSC contractors are expected to support FXXITP product implementation, then their contracted logistics support (CLS) contracts should be written to include that requirement.

Throughout the project, there was a great deal of inconsistency in the level of support available at different simulation centers. One center said that they didn't conduct BBS exercises; another center said they were not required to support brigade-level exercises using Janus. This is contrasted to the experience during the development of the BSE/BBSE, where a third center said they could support anything the unit put in front of them. In order for structured training products to be adequately supported, the simulation center CLS contracts should include language requiring support of the structured training products as they were designed. This could also be expanded to include support requirements for Training Support Brigades and Divisions and for the U.S. Army Reserve Exercise Brigades that could provide this training to RC and AC units in the future.

Training Effectiveness Assessment

On two important objectives of the project, we were totally unsuccessful. We were unable to see even one complete implementation of any of the products, and we were unable to conduct a rigorous assessment of the effectiveness of the training products. As described in Section 3 and earlier in this section, there were a number of reasons: competing unit demands and missions, misunderstandings about product utility, lateness of product introduction into the unit

training calendars, lack of understanding of command emphasis. Despite the presence of training coordinators and surge teams, despite the orientation sessions and train the trainer sessions, the program was not implemented.

But even with a complete implementation, we would not have been able to obtain sufficient data to support a full training effectiveness assessment along the line of Kirkpatrick's model (1994). One or two brigades with ongoing uncontrolled activities, continuous personnel turnover, and the absence of a control group, would not represent acceptable conditions for such a study. Additionally, many of the data sources were not accessible: NTC observers and LTP personnel protect their clientele and their observations closely, quite properly not permitting any results to be used for purposes for which they are not intended.

This is not to say that the assessment work yielded no useful information. A qualitative assessment, with its detailed description of program implementation, can be the method of necessity in many situations, but is often the method of choice (Patton, 1987). Nonetheless, we feel keenly the need for a description of impact.

> *Lesson: We are still in need of a rigorous training effectiveness assessment of the FXXITP products.*

Perhaps the Kirkpatrick model (1994) is not the correct one for this kind of training evaluation. Quasi-experimental methods, such as are propounded in D. T. Campbell and Stanley's classic work (1966) and updated in Cook and Campbell (1979), should be explored as more appropriate possibilities for assessment studies. We ought not to abandon the attempt. The guidance in a variety of guides to program evaluation (e.g., Joint Committee on Standards for Educational Evaluation, 1994; King et al., 1987; Patton, 1987; Rossi & Freeman, 1993; Shadish et al., 1991) should be explored carefully to determine whether there are other approaches that could be incorporated. As we continue to develop structured training products, we should also continue the attempt to obtain evidence of their effectiveness.

Summary

This section has presented discussions of the data summarized in Section 4, and proposed a number of lessons learned. The lessons address considerations of acceptability, impact, supportability, and training effectiveness assessment itself. The lessons are, on one level, discouraging, as they are generally admissions of shortcomings in the FXXITP products. Within the lessons, however, we have attempted to offer solutions to the identified problems. Some of the solutions are more ambitious than others: Some require additional research, while others will require action at the highest levels of Army leadership. No one solution can solve all of the problems, and no one solution can be truly effective for even one problem without implementation of solutions that address all of the problems.

Those solutions that are within the reach of training designers and developers include research on TSP and implementation models, redesign of TSP products and distribution requirements, and planning for maintenance and sustainment of products. Other solutions, including the need for command emphasis at division-level and higher, and the institutionalizing

of the program, will require that TRADOC and Army leaders make a commitment to support the development and implementation of such products that may increase readiness without increasing training costs.

Section 6. Conclusions and Recommendations

In Section 5, we presented a set of 13 lessons, derived from observations, interviews, and analysis of the questionnaire data. The lessons can be further reduced to three critical issues that demand attention, based on this research effort:

- plans for fielding, maintenance, and sustainment;

- methods for making TSPs more usable; and

- Army and TRADOC initiatives for ensuring product use.

Plans for Fielding, Maintenance, and Sustainment

Appendix D contains a briefing prepared for DTDD describing the initial fielding, maintenance, and sustainment planning, and Appendix E outlines the plan with more detail; this plan forms the basis of the ongoing effort within DTDD. Figure 3 illustrates the relationships among the processes. As shown, initial fielding gradually transitions to ongoing sustainment. Similarly, initial updates are succeeded by a process of continuing updates. Feedback and lessons learned during fielding are used to make the initial updates, which are then delivered and incorporated into the already fielded products. This process continues over time: Units use the products and provide suggestions or concerns, and developers use the information to make continual improvements. Although solutions for each part of the process can be planned and executed separately, all three needs must be addressed in order for any solution to be effective.
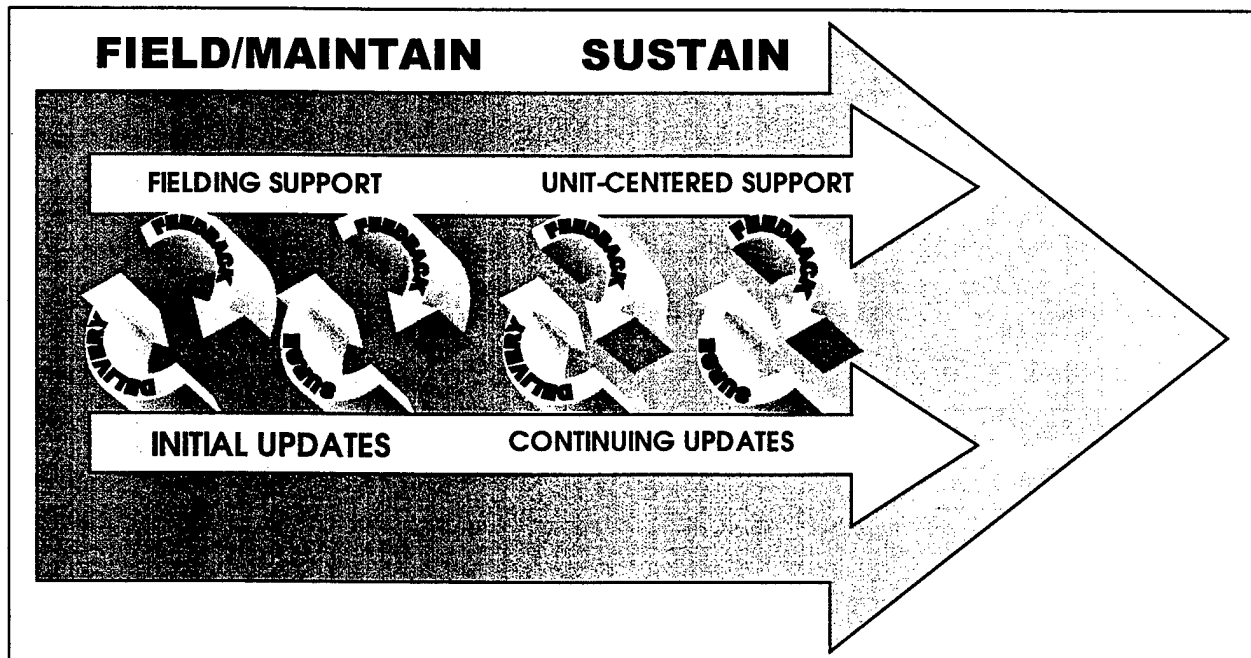

Figure 3. Integration of fielding, maintenance, and sustainment activities for Force XXI Training Program products.

The plan calls for a combination of hot lines and surge teams to work with first users. The same mechanisms would also be useful for obtaining feedback from units using the materials, for use in planning for and carrying out the most urgently needed updates. As the fielding and implementation support are continuing, the update team would be amassing observation, feedback, and lessons learned concerning the products and their use. This information would be used to determine the needs for additional maintenance to the products.

The requirements demand an integrated, multifaceted plan that addresses initial fielding support, immediate updates, continuing maintenance, and ongoing sustainment for users. The plan must take into consideration primary users in the AC and RC units, as well as institutional users and supporters. Finally, the plan must ensure that the personnel who will carry out the activities are of the appropriate levels of expertise and experience with respect to doctrine, technology, and the training products themselves.

Making Training Products More Usable

The objective is worthy: TSP materials should be extremely user friendly and should present no barriers to use. For years, training researchers have been working on visions of materials that participants would use as designed. Despite design innovations and increasingly simplified and comprehensive presentations, however, we find repeatedly that guides and instructions are not used. Directed research on what works, for what products, under what conditions, would be useful in addressing this objective. But the FXXITP and the Army should also be prepared to insist that users attempt to use the products. Until we get a committed effort at implementation, we are still guessing at optimal formats and models.

Army Emphasis on Product Incorporation in Training Plans

All we can do with this recommendation is to ask decision-makers to make their decision: Do they want the products to be used? If so, then they must provide the resources—time and personnel—and the edict that tells units that the products are to be used. They must invest in a fielding, maintenance, and sustainment plan such as the one in Appendix E that will keep the products viable.

As institutionalized training programs, the LTP, CTC rotations, Battle Command Battle Staff Training for RC units, and other such events "work." Why is that? These training programs have an established infrastructure of expert personnel and tested training approaches that ensures support for user units. They are a part of the system: Units know that they must participate, and are eager to do so. The programs' reputation for effective rotation logistics and tough, thorough training ensure units that their time will be well spent. Since the CTCs and other similar programs began to be a part of the Army training system (in the broadest sense), they have become ingrained in the training culture.

This should be the vision for the FXXITP. It will take time and foresight and commitment of resources and planning. Insights drawn from this project should be useful in thinking through the infrastructure and education needs. Lessons learned from the earliest days of CTC history

would also inform the planning process. Finally, research from organizations such as ARI could continue to guide the institutionalization of the program.

Summary

The ISAT project has provided a wealth of valuable information to the FXXITP and the larger training community. The quantitative data were relatively sparse, compared to the richness of the observations and interviews. But in training effectiveness assessments, even when greater amounts of quantitative data are available, the analyses and results must be supplemented with observations and comments. Thus any disappointment with the amount of data is more than relieved by satisfaction with the qualitative information, the honest and constructive input from users, and the insights provided by reviewers. The recommendations and lessons learned should assist the FXXITP, TRADOC, and the Army to continue their attempts to provide training that improves readiness and is accessible by units.

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Appendix A
Acronym List

A2C2	Army Airspace Command and Control
AAR	after action review
AC	active component
ADA	air defense artillery
AFRU	Armored Forces Research Unit
ARI	U.S. Army Research Institute for the Behavioral and Social Sciences
ASAS	All Source Analysis System
ASAT	Automated Systems Approach to Training
ATC	Army Training Center
AUSA	Association of the United States Army
BBS	Brigade/Battalion Battle Simulation
BBSE	Brigade and Battalion Staff Exercise
BCTP	Battle Command Training Program
BLUFOR	Blue Forces
BSC	battle simulation center
BSE	Brigade Staff Exercise
BSTS	Battle Staff Training System
CAC	Combined Arms Center
CALL	Center for Army Lessons Learned
CATS	Combined Arms Training Strategies
CBI	computer-based instruction
CCTT	Close Combat Tactical Trainer
CLS	contracted logistics support
COA	Course of Action
COBRAS	Combined Arms Operations at Brigade Level, Realistically Achieved Through Simulation
COL	colonel
COMPS	comprehensive assessment component
COR	contracting officer's representative
COTS	commercial off the shelf
CP	command post
CSS	combat service support
CTC	Combat Training Center
DA	Department of the Army
DCST	Deputy Chief of Staff for Training
DISCOM	Division Support Command
DMA	Defense Mapping Agency
DTDD	Directorate of Training and Doctrine Development

EMMii	Environment for MultiMedia interactive instruction
EXCON	exercise control
FORSCOM	Forces Command
FRAGO	fragmentary order
FSO	fire support officer
FTX	field training exercise
FXXITP	Force XXI Training Program
HumRRO	Human Resources Research Organization
ISAT	Implementation and Support for the Assessment of Force XXI Training Program
ISD	Instructional Systems Design
LAN	local area network
LTC	lieutenant colonel
LTP	Leader Training Program
NCO	noncommissioned officer
NTC	National Training Center
O/C	observer/controller
OPFOR	opposing forces
OPORD	operation order
PCC	pre-command course
PO	performance objective
QC	quality control
R&S	reconnaissance and surveillance
RC	reserve component
RSOI	reception, staging, onward movement, and integration
RTB	Regional Training Brigade
S1	personnel officer
S2	intelligence officer
S3	operations and training officer
S4	supply/logistics officer
SAT	Systems Approach to Training
SGE	Staff Group Exercises
SIMEX	simulation exercise
SIMNET	Simulation Networking
SME	subject matter expert
SOP	standing operating procedure

SPSS	Statistical Package for the Social Sciences
T3	train-the-trainer
TMS	training management system
TOC	tactical operations center
TOE	Table of Organization and Equipment
TRADOC	U.S. Army Training and Doctrine Command
TSB	Training Support Brigade
TSC	training support coordinator
TSP	training support package
USAARMC	U.S. Army Armor Center
USAREUR	U.S. Army Europe
WARNO	warning order
Y2K	year 2000
XO	executive officer

Appendix B
Assessment Questions of Interest

Level 1 — Reaction: Acceptance by the Training Audience

⇒ Credibility

To what extent are the training materials consistent with current doctrine?

To what extent would battle staff officers recommend the training support packages (TSPs) to their counterparts in other units?

⇒ Ease of Use

How easy is it to use are the various TSP materials?

How acceptable is the time required to prepare and execute the training?

How acceptable are the unit support requirements (personnel, equipment, facilities)?

⇒ Form and Function

How useful are the job aids provided in the TSPs? What others are needed?

What is the quality and timeliness of performance feedback?

How acceptable is the degree of control exercised by trainers/training audience?

How acceptable is the training flexibility provided by the TSPs? [Examine scheduling, mission/task selection, entry points, sequencing, small group composition, support requirements, etc.]

How acceptable are the media used for the various components of the TSPs?

How acceptable is the hardware/software (including reliability and user friendliness)?

⇒ Product Value

What are the strengths of the TSPs? The weaknesses?

How do users feel about the quality of the various TSPs and their components?

How likely are commanders and training officers to use the TSPs?

⇒ Potential Enhancements

What problems are encountered in using the TSPs?

What enhancements would increase ease of use, flexibility, trainer control, user control, effectiveness, and feedback?

Level 2 — Learning: Achievement of Training Objectives

⇒ Suitability of Training Objectives

What knowledge/skills/tasks (individual, collective) do the TSPs train well?

How clearly stated are the training objectives?

Do the TSPs focus on the correct knowledge/skills/tasks for a given staff officer/section?

What critical knowledge/skills/tasks should be added? Which should be eliminated?

To what extent do skills/abilities transfer across the various training products being evaluated (i.e., mutual linkage/support among the four products)?

⇒ Training Effectiveness

How well do the TSPs establish the conditions for achieving the training objectives?

Does the performance feedback focus on the correct topics?

How challenging is the training? How appropriate is the pace?

What improvements or sustainments in knowledge/skills/abilities occur?

What level of mastery is demonstrated during individual (Battle Staff Training System) training?

How does TSP-driven training impact the individual's understanding of his/her position? Of his/her staff section? Of the entire staff?

How much does training with the TSPs improve the individual's confidence in his/her critical skills and abilities? In the abilities of others with whom they work?

How effective are the train-the-trainer materials, including training management information?

⇒ Potential Enhancements

How can the training objectives or their presentation be improved?

How can the TSPs be improved to better support the training objectives?

What other vignettes should be developed to better link the vignettes to Brigade and Battalion Staff Exercise (BBSE) performance objectives?

What changes are needed to meet future training objectives?

How should the training objectives be expanded to support training of digital tasks?

Level 3 — Behavior: Impact on Job Performance

⇒ Job Relevance

To what extent are TSP-based knowledge/skills/abilities applicable to job performance?

To what extent do the TSPs enable practice of skills that would be used during battle?

How useful/valuable are the knowledge/skills/tasks trained?

⇒ Impact on Staff Competence

What aspects of job performance are impacted by training with the TSPs?

How does training with the TSPs impact teamwork and effectiveness of staff sections?

How much does training with the TSPs enhance the confidence of commanders and primary staff officers in the proficiency of their staff(s)?

⇒ Impact on Staff Performance

To what extent is the individual/section/unit prepared for a Combat Training Center-like experience?

What skills, tasks, section/group activities, etc. appear to be enhanced as the National Training Center (NTC) rotation starts? Which of these enhancements result from TSP-driven training?

To what extent does TSP-driven training enhance staff proficiency and effectiveness at the start of NTC training?

What level of staff process performance is evident during the first NTC mission? During the last?

What battle outcomes are evident during the various NTC missions?

What performance strengths and weaknesses are noted in NTC (or Brigade Staff Exercise [BSE]/BBSE) after action reviews?

To what extent do knowledge/skills/abilities acquired in using the TSPs enhance job performance at the NTC (or in command post exercises)?

How does TSP-driven training contribute to unit performance at the NTC?

⇒ Potential Enhancements

How could the TSPs be improved to impact job performance more favorably?

How should the TSPs be modified to meet job performance requirements of the future?

What enhancements are needed to meet job performance requirements of digital units?

Level 4 — Results: Impact on Organizational Objectives and Resources

⇒ Relevance to Unit Goals and Requirements

How do the TSPs facilitate/hinder preparations for an NTC rotation?

How well do the training outcomes of the various products compare with the unit training goals?

How does training with the TSPs impact unit readiness?

Where does each of the products fit into the unit training strategy?

To what extent are the TSPs compatible with existing Combined Arms Training Strategies (CATS)?

How should the TSPs be incorporated into long-range training plans? Into CATS?

⇒ Cost-Benefit Considerations

What does it cost (time, funds, support requirements, etc.) to use the training products (preparation and execution)?

How do the TSPs compare (in terms of time, fiscal cost, support requirements, ease of use, fidelity, value added, etc.) with other training tools available for similar purposes?

To what extent do the training products save the unit time, funds, etc. in preparing for an NTC rotation?

What is the likely resource impact of using the TSPs? What resource problems are anticipated?

To what extent do the benefits of the training outweigh the costs?

How valuable would it be for the Army to field the TSPs?

⇒ Potential Enhancements

How could the TSPs be modified/expanded to enhance their value to units?

What steps should be pursued to meet future training needs?

How should the products be enhanced to support training for digital operations?

Implementation: Utilization, Implementation and Support Issues

⇒ Training Management and Product Utilization

How do units manage selection, scheduling, and preparation for TSP-driven training?

With what frequency, timeliness and sequencing do individuals/units use the TSPs?

How much time is taken to prepare and complete the training? Is it realistic?

How perishable are the knowledge and skills trained in the TSPs?

How often should sustainment (refresher) training occur with the TSPs?

⇒ Compliance with TSP Procedures

To what extent do individuals/units comply with TSP instructions (preparation and execution)?

What personnel serve as observer/controllers for training with products?

What personnel staff the Division Response Cell during BSE and BBSE exercises?

How do Simulation Center personnel train/prepare for TSP exercises?

What training environment factors (e.g., turnover, staffing difficulties, time constraints, command emphasis) influence the use of the TSPs?

What misunderstandings do the users have regarding the training products?

⇒ Support Requirements

What kinds of support do individuals/units request from the ISAT Team? From Simulation Center personnel?

What is the quality of implementation support provided by the ISAT Team? By Simulation Center personnel?

What are the minimum essential support requirements for fielding?

What steps can be taken to facilitate implementation when the ISAT Team is no longer available?

⇒ Implementation Considerations

Where should training with the various TSPs take place (schoolhouse, unit, etc.)?

What problems are encountered in implementing the TSPs (distribution, equipment, facilities, management, exercise control, etc.)?

How exportable are the hardware/software components?

What hardware/software modifications are needed to support fielding?

What obstacles stand in the way of implementing the TSPs?

⇒ Lessons Learned

What innovative practices and techniques do users/trainers develop?

What innovative uses or applications do units find for the training products?

What lessons learned will benefit future development and implementation efforts?

Appendix C
Sample Data Collection Instruments

Document Title	Page
ISAT Survey – Training Audience Feedback: Battle Staff Training System	C-2
ISAT Survey – Training Audience Feedback: Post-National Training Center	C- 8
ISAT Structured Interview Guide: BBSE Execution	C-17
ISAT Observer's Guide: BBSE Execution	C-24

ISAT SURVEY

Training Audience Feedback: Battle Staff Training System
PT No. 60-12a

Instructions

This survey asks for your opinions about the BSTS course you just completed. The survey gives you the opportunity to influence this Force XXI Training Program product through your comments and suggestions.

Please answer each question based on your experiences as you worked through the course.

Information obtained from this survey will be used for training effectiveness analysis purposes. Neither you nor your unit will be referenced, without permission, in any briefing or publication.

Thank you for your input.

Date: _____

⇨ **Please enter the first letter of your last name plus the last four digits of your SSN:** __ __ __ __ __

1. What BSTS course did you take? _____
2. What is your rank? _____
3. What is your branch specialty or MOS? _____
4. What is your current duty position? _____
5. How long have you been in your current duty position? _____ yrs / _____ mos

6. Which military courses have you completed? (Circle all that apply)
   OBC   OAC   CAS3   C&GSOC   SAMS   AWC
   Other (please specify): _____

7. Which Officer Advanced Course did you complete? Circle one.

Armor	Infantry	Field Arty	ADA	Signal	Aviation
Engineer	Mil Intel	Quartermaster	Transp'n	Chemical	Adj General
Other (please specify):					

8. Please list your previous Bn/Bde/Div staff assignments (e.g., Bn S4):

9. How many times have you participated in the following training events?	Circle one for each item:				
	Never	Once	Twice	Three Times	> Three Times
a. National Training Ctr (NTC) rotation	0	1	2	3	4
b. Joint Readiness Training Ctr (JRTC) rotation	0	1	2	3	4
c. Cbt Maneuver Training Ctr (CMTC) rotation	0	1	2	3	4
d. Leader Training Program (LTP)	0	1	2	3	4
e. Warfighter	0	1	2	3	4
f. Battle Command Training Program (BCTP)	0	1	2	3	4
g. Bde Command & Battle Staff Training (BCBST)	0	1	2	3	4
h. Janus and BBS staff exercises	0	1	2	3	4

Acceptability of the Training Materials

10. How easy/difficult was it to use the following?	Circle one for each item:				
	Did not Use	Very Difficult to Use		Neutral	Very Easy to Use
a. Student Guide	0	1	2	3	4	5
b. Job Aids	0	1	2	3	4	5
c. Computer-Based Modules	0	1	2	3	4	5
d. FMs, other References	0	1	2	3	4	5

11a. To what extent were the following consistent with current doctrine?	Circle one for each item:				
	Did not Use	Totally Inconsistent		Neither	Totally Consistent
(1) Course Contents	0	1	2	3	4	5
(2) Division/Brigade OPORD	0	1	2	3	4	5
(3) Graphic Overlays	0	1	2	3	4	5
(4) Practical Exercises	0	1	2	3	4	5

11b. What changes would make these materials more consistent with doctrine?

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12. Our BCT / BN should use the BSTS courses for training in the future. Circle one:	Don't Know	Strongly Disagree	2	Neutral	4	Strongly Agree
	0	1		3		5

13. I recommend that other BCTs or BNs use the BSTS courses for their training. Circle one:	Don't Know	Strongly Disagree	2	Neutral	4	Strongly Agree
	0	1		3		5

Achievement of Training Objectives

14. To what extent were your course's training objectives:	Circle one for each item:				
	To No Extent	Slight Extent	Moderate Extent	Great Extent	To a Very Great Extent
a. Clearly stated?	1	2	3	4	5
b. Focused on the right tasks for my position?	1	2	3	4	5
c. Appropriate for self-study?	1	2	3	4	5

15. Please list topics or materials that should be added to the course:

16. The course materials, practical exercises, exams, etc. established the conditions for successful training. Circle one:	To No Extent	Slight Extent	Moderate Extent	Great Extent	To a Very Great Extent
	1	2	3	4	5

17. To what extent did the course:	Circle one for each item:				
	To No Extent	Slight Extent	Moderate Extent	Great Extent	To a Very Great Extent
a. Improve my understanding of my tasks?	1	2	3	4	5
b. Improve my ability to perform my tasks?	1	2	3	4	5
c. Improve my understanding of the staff?	1	2	3	4	5
d. Provide effective feedback?	1	2	3	4	5

18. Please list the areas in which you gained substantial knowledge:

19. How would you improve the feedback procedures?

Impact on Job Performance

20. Indicate the extent to which this course:	Circle one for each item:				
	To No Extent	Slight Extent	Moderate Extent	Great Extent	To a Very Great Extent
a. Gave me knowledge/skills that are applicable to my job performance in combat.	1	2	3	4	5
b. Provided information that I value highly.	1	2	3	4	5
c. Enabled me to practice techniques that I would use during battle.	1	2	3	4	5

21. List two aspects of your job performance that may benefit most from the course:

Impact on Unit Training Program

22. To what extent does this course:	Circle one for each item:				
	To No Extent	Slight Extent	Moderate Extent	Great Extent	To a Very Great Extent
a. Help our BCT or BN meet its staff training goals?	1	2	3	4	5
b. Make me better prepared for an LTP/NTC rotation?	1	2	3	4	5
c. Save training time for our BCT or BN?	1	2	3	4	5
d. Save training funds for our BCT or BN?	1	2	3	4	5
e. Enhance our BCT's combat readiness?	1	2	3	4	5

23. Please list the two most important benefits the staff receives from BSTS training:

24a. To what extent do the benefits of this staff training course outweigh the costs? Circle one:	To No Extent	Slight Extent	Moderate Extent	Great Extent	To a Very Great Extent
	1	2	3	4	5
24b. If you circled "1" or "2" please explain why:					

25. Given the training value of this course, the amount of time spent is: (Circle one)	Totally Unacceptable 1	2	Neutral 3	4	Totally Acceptable 5

General Comments

	Circle one for each item:				
	Totally Unacceptable		Neutral		Totally Acceptable
26a. The ISAT Team's support was:	1	2	3	4	5
26b. The Sim Center staff's support was:	1	2	3	4	5

27. How would you improve the course materials and presentation?

28. Please provide additional suggestions and comments about the course.

ISAT SURVEY

Training Audience Feedback: Post-National Training Center
PT No. 60-12v

Date: _____

⇨ **Please enter the 1st letter of your last name plus the last 4 digits of your SSN:** __ __ __ __ __

1. What is your rank? _____
2. What is your branch specialty or MOS? _____
3. What is your unit of assignment? (circle one)   Bde HQ   1/34 AR   2/34 AR
       1/5 FA   1 EN   101 FSB   Other _____
4. What is your current duty position? _____
5. How long have you been in your current duty position? ____ yrs / ____ mos
6. How long have you been assigned to the 1 BCT/1 ID? ____ yrs / ____ mos
7. How much time have you spent as a Div/Bde/Bn staff officer? ____ yrs / ____ mos

8. Which Battle Staff Training System (BSTS) courses did you take? (Circle all that apply)						
Cdr	XO	S1/Chaplain	S2	S3	S4	S5
FSO	ENG	ADAO	SIGO	CHEMO	S3-Air	Common Core

9. In which Vignettes did you participate previously? (Circle all that apply)
       Mission Analysis   Develop Concept of Svc Spt
       COA Analysis   Other _____

10. What role did you play in the Bde Ops Exercise (Oct 98 – Janus)? (Circle one)					
Main CP Staff	Rear CP Staff	2/34 TOC	101 FSB TOC	1/5 FA TOC	1 EN TOC
Workstation Roleplayer	Other _____				Did Not Participate

11. What role did you play in the Bde/Bn Staff Exercise (Jan 99 – BBS)? (Circle one)					
Bde TOC	1/34 TOC	2/34 TOC	101 FSB TOC	1/5 FA TOC	1 EN TOC
Workstation Roleplayer	Other _____				Did Not Participate

12a. Did you fill your normal duty position during the NTC rotation?
Yes   No
12b. If you circled "No", please specify the role you filled: _____

Preparation for the NTC
*** In questions 13, 14, and 15 please use the following scale:

Don't Know	Very Weak	Weak	Neither	Strong	Very Strong
0	1	2	3	4	5

13. Rate the staff processes of your element in **June 98** (Cdr/XO rate entire staff, S3 rate S3 staff section, FSO rate FSE, etc.):   (Circle one value in every cell under the plan-monitor-direct columns)

	PLAN	MONITOR	DIRECT
a. Reconnaissance operations	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
b. Parallel planning	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
c. Information management	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
d. Integration of fires	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
e. Accelerated decision making	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5

14. Rate the staff processes of your element in **October 98** (Cdr/XO rate entire staff, S3 rate S3 staff section, FSO rate FSE, etc.):   (Circle one value in every cell under the plan-monitor-direct columns)

	PLAN	MONITOR	DIRECT
a. Reconnaissance operations	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
b. Parallel planning	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
c. Information management	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
d. Integration of fires	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
e. Accelerated decision making	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5

15. Rate the staff processes of your element in **late March 99** (Cdr/XO rate entire staff, S3 rate S3 staff section, etc.):   Circle one value in every cell under the plan-monitor-direct columns)

	PLAN	MONITOR	DIRECT
a. Reconnaissance operations	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
b. Parallel planning	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
c. Information management	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
d. Integration of fires	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5
e. Accelerated decision making	0 1 2 3 4 5	0 1 2 3 4 5	0 1 2 3 4 5

16a. Considering the improvement in staff processes from Jun 98 to Mar 99, indicate the extent to which the following contributed to the improvement:	Circle one for each item:					
	Don't Know	To No Extent	Slight Extent	Moderate Extent	Great Extent	To a Very Great Extent
(1) BSTS Courses	0	1	2	3	4	5
(2) COBRAS Vignettes	0	1	2	3	4	5
(3) Janus Exercise (Oct 98)	0	1	2	3	4	5
(4) Performance Objectives Package	0	1	2	3	4	5
(5) Leaders Training Program	0	1	2	3	4	5
(6) Bde/Bn Staff Exercise (Jan 99)	0	1	2	3	4	5
(7) Gauntlet	0	1	2	3	4	5
(8) BBS Exercise (Mar 99)	0	1	2	3	4	5
(9) Other _____	0	1	2	3	4	5
(10) Other _____	0	1	2	3	4	5
(11) Other _____	0	1	2	3	4	5

16b. Please explain how key items contributed to the improvement:

17a. Indicate the extent to which the Battle Staff Training System (BSTS) courses provided knowledge, skills, and abilities directly relevant to:	Circle one for each item:					
	Don't Know	To No Extent	Slight Extent	Moderate Extent	Great Extent	To a Very Great Extent
(1) The RSOI training.	0	1	2	3	4	5
(2) The force-on-force training.	0	1	2	3	4	5
(3) The live fire training.	0	1	2	3	4	5

17b. Please explain:

18a. Indicate the extent to which the COBRAS Vignettes provided knowledge, skills, and abilities directly relevant to:	Circle one for each item:					
	Don't Know	To No Extent	Slight Extent	Moderate Extent	Great Extent	To a Very Great Extent
(1) The RSOI training.	0	1	2	3	4	5
(2) The force-on-force training.	0	1	2	3	4	5
(3) The live fire training.	0	1	2	3	4	5

18b. Please explain:

19a. Indicate the extent to which the Janus exercise (Oct 98) provided knowledge, skills, and abilities directly relevant to:	Circle one for each item:					
	Don't Know	To No Extent	Slight Extent	Moderate Extent	Great Extent	To a Very Great Extent
(1) The RSOI training.	0	1	2	3	4	5
(2) The force-on-force training.	0	1	2	3	4	5
(3) The live fire training.	0	1	2	3	4	5

19b. Please explain:

20a. Indicate the extent to which the Brigade/Battalion Staff Exercise (Jan 99) provided knowledge, skills, and abilities directly relevant to:	Circle one for each item:					
	Don't Know	To No Extent	Slight Extent	Moderate Extent	Great Extent	To a Very Great Extent
(1) The RSOI training.	0	1	2	3	4	5
(2) The force-on-force training.	0	1	2	3	4	5
(3) The live fire training.	0	1	2	3	4	5

20b. Please explain:

21. What significant tasks didn't get trained during pre-NTC training? Why?

Impact on NTC Performance

22. Indicate the extent to which your training with the Force XXI products:	Circle one for each item:					
	Don't Know	To No Extent	Slight Extent	Moderate Extent	Great Extent	To a Very Great Extent
a. Helped you understand your commander's expectations.	0	1	2	3	4	5
b. Helped you meet your commander's information requirements.	0	1	2	3	4	5
c. Helped you support your commander's decision-making process.	0	1	2	3	4	5
d. Improved your situational awareness skills.	0	1	2	3	4	5
e. Enhanced your unit's synchronization of combat, CS, and CSS assets.	0	1	2	3	4	5

23a. Indicate the extent to which the simulation exercises you participated in (Janus, BBS):	Circle one for each item:					
	Don't Know	To No Extent	Slight Extent	Moderate Extent	Great Extent	To a Very Great Extent
(1) Helped you orient to NTC terrain.	0	1	2	3	4	5
(2) Helped you do terrain analysis.	0	1	2	3	4	5
(3) Helped you visualize the plans.	0	1	2	3	4	5
(4) Helped you monitor the battle.	0	1	2	3	4	5

23b. Please explain how the simulation exercises helped:

24a. Overall, how did the following impact your NTC performance?	Circle one for each item:					
	Didn't Use	Very Harmful		Neither		Very Beneficial
(1) BSTS Courses	0	1	2	3	4	5
(2) COBRAS Vignettes	0	1	2	3	4	5
(3) Janus Exercise (Oct 98)	0	1	2	3	4	5
(4) Performance Objectives package	0	1	2	3	4	5
(5) Leaders Training Program	0	1	2	3	4	5
(6) Bde/Bn Staff Exercise (Jan 99)	0	1	2	3	4	5
(7) Gauntlet	0	1	2	3	4	5
(8) BBS Exercise (Mar 99)	0	1	2	3	4	5

24b. Please explain:

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25. List three ways in which your training with Force XXI products impacted your NTC performance:

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Impact on Unit Training Program

26. In light of your NTC experience, to what extent did your training with the Force XXI products:	Circle one for each item:					
	Don't Know	To No Extent	Slight Extent	Moderate Extent	Great Extent	To a Very Great Extent
a. Help your unit meet its staff training goals?	0	1	2	3	4	5
b. Make your unit better prepared for its NTC rotation?	0	1	2	3	4	5
c. Save training time for your unit?	0	1	2	3	4	5
d. Save training funds for your unit?	0	1	2	3	4	5
e. Enhance your unit's deployability?	0	1	2	3	4	5
f. Help your unit improve its SOPs?	0	1	2	3	4	5

27a. To what extent should your BCT use the following to sustain proficiency?	Circle one for each item:					
	Don't Know	To No Extent	Slight Extent	Moderate Extent	Great Extent	To a Very Great Extent
(1) BSTS Courses	0	1	2	3	4	5
(2) COBRAS Vignettes	0	1	2	3	4	5
(3) Janus/BBS Exercises	0	1	2	3	4	5
(4) Performance Objectives Package	0	1	2	3	4	5
(5) Bde/Bn Staff Exercise	0	1	2	3	4	5
(6) Other _____	0	1	2	3	4	5
(7) Other _____	0	1	2	3	4	5
(8) Other _____	0	1	2	3	4	5

27b. Please explain why:

28a. To what extent would you recommend that other BCTs use the following products for NTC preparation?	Circle one for each item:					
	Don't Know	To No Extent	Slight Extent	Moderate Extent	Great Extent	To a Very Great Extent
(1) BSTS Courses	0	1	2	3	4	5
(2) COBRAS Vignettes	0	1	2	3	4	5
(3) Janus/BBS Exercises	0	1	2	3	4	5
(4) Performance Objectives Package	0	1	2	3	4	5
(5) Bde/Bn Staff Exercise	0	1	2	3	4	5
(6) Other _____	0	1	2	3	4	5

28b. Please explain why:

29. Based on your observations during the recent rotation, what other products or exercises are needed to fully prepare for the NTC?

General Comments

30. Based on your observations during the NTC rotation, how would you improve or expand the Force XXI training products?

31. Please provide additional suggestions and comments about the Force XXI training products and your preparation for the NTC.

ISAT STRUCTURED INTERVIEW GUIDE

BBSE Execution

PURPOSE

This form provides instructions for ISAT Team members when they conduct interviews with the training audience, Exercise Director, COBRAS Coordinator, BLUFOR Controller, roleplayers, interactors, observers, and site staff regarding BBSE training.

INSTRUCTIONS

A. The purpose of the interview is to follow up important themes noted while observing unit personnel as they execute the BBSE.

B. Review the attached list of questions before the interview starts. Select 5-7 questions dealing with key issues that surfaced during preparation or execution of training. Plan to spend about 10 minutes on each question.

C. Use the questions as a *guide*. When unique issues important to the group arise, make time to discuss them.

D. Establish a relaxed, friendly atmosphere at the outset. Tell the group why their input is important. State how long you expect the session to last.

E. If possible, have another Team member take notes. Capture the name, duty assignment, and unit of each group member. Take careful notes—when in doubt, write it down.

F. Use a tape recorder to obtain an audio record for *backup* purposes. At the outset, ask if anyone objects to this.

G. Be sure you understand what the participants are saying. Ask for clarification when needed.

H. Be an unbiased facilitator. Avoid leading the trainers with your expectations.

I. Listen to comments and suggestions with an open mind. Avoid defending our products.

J. Try to keep the group focused on the task at hand. Avoid digressions.

K. Try to limit the session to 90 minutes or less; take your cues from the participants.

L. Organize your notes and enter them into a file as soon as you can. Forward them to Bruce within one week after the end of the exercise.

M. Take questions about the use of this form to Bruce (502-352-5200).

TRAINING AUDIENCE (Primary & Secondary)

Pre-Exercise Preparation
- What actions did you take after the December train-up to prepare for the exercise? How much time did you spend on each action? (Consider: reviewing Training Audience Guide and other materials, copying overlays, reviewing FMs, etc.)
- What would you do differently during preparation for the exercise next time? (Consider: access to materials, train-up, time available, etc.)

Exercise Execution
- What problems did you encounter in executing the exercise? (Consider: getting started, physical facilities, tactical commo, materials provided, quality of orders and messages from EXCON, coaching, AARs, training schedule, etc.)
- How effective were the coaching and AARs? How could the performance assessment and feedback procedures be improved?
- What other execution materials (e.g., job aids, checklists) would you like to have?

Contributions to Unit Training Program
- How might training with the exercise benefit: (a) subsequent homestation collective training; (b) unit readiness for the NTC?
- How might this training help your unit develop/improve its SOPs?
- How valuable would your unit find similar exercises for future training? How can the exercises be shaped for maximum training benefit?

Implementation Issues
- What obstacles do you envision if your unit trains with similar exercises in the future? What can be done to overcome those obstacles?
- What could be done to better enable the unit to execute this exercise in the future? What assistance would be needed from outside the division?

How to Enhance the BBSE?
- How would you improve the training materials and procedures? (Consider: doctrinal consistency, schedule of events, site support, etc.)
- What enhancements are needed to meet training requirements for *digital* operations?

ROLEPAYERS AND INTERACTORS

Pre-Exercise Preparation

- What actions did you take after the December train-up to prepare for the exercise? How much time did you spend on each action? (Consider: preparing and organizing job aids, copying materials, reviewing the TACSOP, etc.)
- What would you do differently during preparation for the exercise next time? (Consider: access to materials, train-up, time available, etc.)
- What other preparation activities should have been accomplished prior to STARTEX?

Exercise Execution

- What problems did you encounter in executing the exercise? (Consider: getting started, physical facilities, tactical commo, materials provided, workstation operations, workload, assistance from ISAT or Site Teams, etc.)
- How well prepared were you when the exercise started? In what areas did you find yourselves under-prepared?
- What other execution materials (e.g., job aids, checklists) would you like to have?

Contributions to Unit Training Program

- How do you expect to benefit from your participation in this exercise? How might your unit benefit?
- How might this training help your unit develop/improve its SOPs?
- How valuable would your unit find similar exercises for future training? How can the exercises be shaped for maximum training benefit?

Implementation Issues

- How important was the external assistance from the ISAT and Site Teams in enabling you to effectively support the exercise? Which aspects were critical?

How to Enhance the BBSE?

- How could the materials you worked with be improved? What new materials would you like to have?
- What enhancements would be needed to meet training requirements for *digital* operations?

EXCON CELL (Rolepayers and Interactors)

Pre-Exercise Preparation
- What actions did you take after the December train-up to prepare for the exercise? How much time did you spend on each action? (Consider: reviewing the EXCON Roleplayer Guide and other materials, preparing and organizing job aids, etc.)
- How would you improve the advance materials and procedures? (Consider: access to materials, train-up, time available, etc.)
- What other preparation activities should have been accomplished prior to STARTEX?

Exercise Execution
- What problems did you encounter in supporting the brigade staff? (Consider: getting started, physical facilities, tactical commo, maps, materials provided, workstation operations, workload, coordination, etc.)
- How well prepared were you when the exercise started? In what areas did you find yourselves under-prepared?
- What activities were most difficult to perform? Why? (Consider: sending prepared messages, responding to brigade requests for information, monitoring the simulation, preparing Intel updates, operating the workstations, etc.)

Contributions to Unit Training Program
- How do you expect to benefit from your participation in this exercise? How might your unit benefit?
- How might this training help your unit develop/improve its SOPs?
- How valuable would your unit find similar exercises for future training? How can the exercises be shaped for maximum training benefit?

Implementation Issues
- How important was the external assistance from the ISAT and Site Teams in enabling you to effectively support the exercise? Which aspects were critical?

How to Enhance the BBSE?
- How would you improve the training materials and procedures? (Consider: quality of tactical materials, staffing, coordination procedures, site support, etc.)
- What enhancements would be needed to meet training requirements for *digital* operations?

OBSERVERS

Pre-Exercise Preparation

- What actions did you take after the December train-up to prepare for the exercise? How much time did each action take? (Consider: reviewing Observer Guide and Performance Objectives, preparing the observation plan, developing AAR schedule, reviewing the pertinent TACSOP, tactical familiarization, etc.)
- What problems did you encounter in obtaining copies of each Performance Objective's observation guide? (Consider: availability of materials in Apx C of the Observer Guide, duplication of materials, etc.)
- What would you do differently during preparation for the exercise next time? (Consider: scheduling, additional materials, train-up, time available, etc.)

Exercise Execution

- What problems did you encounter in serving as an Observer? (Consider: implementing the observation plan, coaching, preparing and presenting AARs, workload issues, physical facilities, tactical commo, admin commo, etc.)
- How easy was it to use the observation guide for each Performance Objective during the exercise? (Consider: basic instructions, organization of information, bulk, clarity, ease of recording performance, etc.)
- How effective were the coaching and AAR procedures? How could the performance assessment and feedback procedures be improved?
- How do you feel about the take-home summary reports? How would you change them?

Contributions to Unit Training Program

- How might training with the exercise benefit: (a) subsequent homestation collective training; (b) unit readiness for the NTC rotation?
- How valuable would the unit find similar exercises for future training? How can the exercises be shaped for maximum training benefit?

How to Enhance the BBSE?

- How would you improve the observation and feedback procedures? (Consider: Observer staffing, observation materials and procedures, coaching, AAR procedures, sequence of events, administrative coordination, etc.)

CONTROL PERSONNEL
(Exercise Director, COBRAS Coordinator, BLUFOR Controller)

Pre-Exercise Management and Preparation
- What actions did you or your representative take after the December train-up to prepare for the exercise? How much time did each action take? (Consider: reviewing Exercise Guide, coordinating facilities and participants, obtaining maps and supplies, copying and distributing materials, etc.)
- What would you do differently during preparation for the exercise next time? (Consider: scheduling, coordinating facilities and participants, distributing materials, train-up, time available, etc.)

Exercise Execution
- What problems did you observe in executing the exercise? (Consider: getting the exercise started, monitoring and controlling the exercise, observing performance, preparing and presenting AARs, EXCON and OPFOR staffing, physical facilities, tactical commo, admin commo, training schedule, workload issues, etc.)
- What coordination procedures did you use (e.g., White Cell)? How well did the procedures work for surfacing and resolving issues? What would you change?
- What other execution materials (e.g., job aids, checklists) would you like to have?

Contributions to Unit Training Program
- How might training with the exercise benefit: (a) subsequent homestation collective training; (b) unit readiness for the NTC rotation?
- How valuable would the unit find similar exercises for future training? How can the exercises be shaped for maximum training benefit?

Implementation Issues
- What could be done to better enable the unit to execute this exercise in the future? What obstacles would have to be overcome? What external assistance would be needed?

How to Enhance the BBSE?
- How could the TSP be improved to better meet anticipated training needs? (Consider doctrinal consistency, emerging unit missions, training environment, etc.)
- What enhancements are needed to meet training requirements for *digital* operations?

SITE STAFF

Pre-Exercise Preparation

- What actions did you take after the December train-up to prepare for the exercise? How much time did you spend on each action? (Consider: reviewing Site Manager Guide and other materials, tactical familiarization, workstation and commo set-up, loading and testing BBS files, coordinating with the unit or ISAT Team, etc.)
- What would you do differently during preparation for the exercise next time? (Consider: coordination, set-up, train-up, time available, facilities, etc.)
- What other preparation activities should have been accomplished prior to STARTEX? (Consider: site activities, unit activities, coordination, etc.)

Exercise Execution

- What problems did you encounter in supporting the exercise? (Consider: getting started, physical facilities, materials provided, workstation operations, site staffing, workload, etc.)
- What assistance did you provide to the interactors and roleplayers? In what areas did they have a lot of difficulty?
- What other execution materials (e.g., job aids, checklists) would you like to have?
- How would you recommend changing the staffing of the workstation cells? (Consider: types of personnel, number of personnel, allocation of functions, etc.)
- What problems resulted from brigade and battalion personnel training in the same exercise? (Consider: eavesdropping, unrealistic interaction, game-playing, etc.

Implementation Issues

- How many site staff members should be on-hand during execution of this exercise? Where should they be located?
- What additional site support should the unit have in executing this exercise in the future? (Consider: facilities, equipment, staffing, administrative needs, etc.)

How to Enhance the BBSE?

- How could the materials you worked with be improved? What other materials would you like to have?
- What enhancements would be needed to meet training requirements for *digital* operations?

ISAT OBSERVER'S GUIDE
BBSE Execution

Date: _____

Observer: _____ **Assignment:** _____ **Unit:** _____

PURPOSE

This guide provides instructions for ISAT data collectors when they observe the BBSE execution at the Battle Simulation Center. It lists questions of interest and organizes the note-taking.

INSTRUCTIONS
A. Keep this guide with you as you observe the exercise. Use it to structure your observation activities and note-taking. There is only one form for ISAT observers.
B. Review the attached list of questions at the outset. They are only a *guide*. Be sure to capture all worthwhile information, whether it's listed in this guide or not.
C. Observe the elements you're responsible for—watch, listen, query. Chat with the participants during breaks. Feel free to comment on other elements—just be sure to state to whom your comments are referring.
D. Be sure you understand what the participants are doing and saying. Ask for clarification when needed, but don't interrupt something important.
E. Rotate the focus of your attention. When something of special interest occurs, try to shift to that.
F. Listen to comments and suggestions with an open mind. Avoid defending our products.
G. Record your observations and the participants' comments by writing on this form. When in doubt, write it down. Use extra paper as needed.
H. Allow the trainers and participants to use the resources in the TSP. Your job is to *monitor*, not "save" the unit or force the products to look good.
I. Do *not* direct or interfere with the activities of the training audience or trainers.
J. Give your notes to Dave Pratt at the end of the exercise.
K. Take questions about the use of this guide to Bruce Leibrecht, 502-352-5200.

Pre-Exercise Activities

Question	Comments
What did the personnel in your element do to prepare since the train-up? How much time did they take?	
What materials do the participants bring to the exercise? What materials are they missing?	
What confusion is there among participants, trainers, etc. about what to expect?	
Does the unit have a detailed training schedule? What events are planned?	
How would you rate the readiness of your elements at the start of training? What shortfalls do you see?	
Other observations:	

Exercise Execution

Question	Comments
Who serves as: • Exercise Director? • COBRAS Coordinator? BLUFOR Controller? Have these changed since the train-up?	
Who supervises or directs the activities in your element? How does he perform his job? How much of the time is he on-site?	
What significant departures from the published schedule occur?	
Is your element staffed as specified in the TSP? If not, who is missing? Are there any stand-ins? Do personnel stay for the entire exercise?	
Interactor/Roleplayer refresher training: What refresher training occurs? Who delivers the instruction?	
What misunderstandings are apparent re: training objectives, roles and responsibilities, etc.?	
How do the Observers perform their jobs? Do they use an observation plan? Do they use the assessment guide for each Performance Objective? How do the Observers depart from the TSP?	
What kinds of requests for assistance do you receive from personnel in your element?	
What problems occur during the course of the exercise? Why do the problems occur?	

How do they impact the training? Are important problems addressed by the Exercise Director?	
Do personnel in you element appear to have the appropriate skills to carry out their tasks? Describe any apparent short-comings.	
What facilities problems occur? (Include observations regarding the BBS environment.)	
What suggestions do you hear for improving the training materials and procedures?	
How do the personnel in your element feel about the value of the training?	
Comment on any apparent difficulties related to using BBS to drive the exercises.	
Do you observe specific behaviors or events which might degrade the quality of training? Describe such observations.	
Other observations:	

AAR Activities

Question	Comments
Who leads the AARs for your element (Bde/TF)? How does he prepare for the AARs? How much time does he take?	
What steps are followed in conducting the AARs? How do they differ from the AAR procedures recommended in the TSP?	
How long does each AAR take? Is it enough time?	
Does the training audience end up with a clear understanding of strengths and weaknesses? If not, why?	
Do the Cdr and his staff appear satisfied with the AARs? If not, explain.	
What are two keys for improving the AARs?	
Other observations?	

A Briefing

Presented to
COL Blankmeyer, DTDD
18 March 1999

FXXI-Training Program
Fielding-Update-Sustainment
Strategy

18 March 1999

Prepared by: ISAT Team

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Over the past five years, the Force XXI Training Program has been responsible for the development of a variety of training products for combined arms forces. The training products have been used in a limited number of units, but are not yet widely fielded. Furthermore, no mechanism is in place to ensure that the products are upgraded in response to changes in doctrine, organizations, and equipment.

Purpose

♦ **To provide DTDD and the Force XXI - Training Program with a strategy for fielding, updating, and sustaining the products developed over the last five years**

♦ **To provide an estimate of the effort required to update the programs**

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The purpose of this briefing is describe the requirements for fielding, updating, and sustaining the products, as well as to provide an estimate of the update effort in both staff months and calendar months..

Agenda

- **Background**
- **The Strategy**
  - Fielding
  - Updating Current Products
  - Supporting the Force
  - Surge Effort Considerations
  - Sustaining the Products

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The agenda includes:

- The background on

  -Products

  -the stepping stone approach to using the products

  -feedback received from the force during the trials of these products and during the ISAT project

- The strategy for initially fielding and simultaneously updating the products

- An approach to both low-level and surge-level support for units

- Discussion of the on-going need for sustainment

Products

Product	Developed
Battle Staff Training System (BSTS)	1994-1996
Bde Common Core modified to CBI	1998
Small Group Exercises (SGE)	1994-1996
Format of earlier exercises modified	1998
Brigade Staff Exercise (BSE)	1994-1996
Bde/Bn Staff Exercise (BBSE)	1997-1998

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The Battle Staff Training System (BSTS) –series of modules for brigade and battalion staffs that provide individual instruction, practice, and comprehensive testing on staff tasks and processes. Comprises both computer-based and paper-based materials, and also a training management system. Completed in 1996, partially updated in 1998 to convert one set of materials to completely computer-based mode.

Small Group Exercises (SGE) – 24 self-contained vignette exercises for the brigade staff. Focuses on selected members of the staff reacting to a well-defined problem in a scenario setting. Problems are drawn from such sources as NTC and other CTC trends analyses and first-hand experience of NTC O/C). 20 of the exercises require no simulation support; the other four use Janus or the Brigade and Below Battle Simulation (BBS). Completed in 1996, and in 1998 modified slightly to increase usability.

The Brigade Staff Exercise (BSE) – A BBS-driven structured exercise for the commander and staff of a combined arms brigade. Three missions are included. The BSE focuses on staff coordination and use of all assets throughout mission planning, preparation, execution, and consolidation and reorganization. The BSE, which was completed in 1996, provides basic "crawl" level staff practice opportunities.

The Brigade and Battalion Staff Exercise (BBSE) – A BBS-driven structured exercise for the commander, staff, and one to three battalions of a combined arms brigade. The BBSE incorporates many of the features of a CTC rotation, including 24-hour operations; deployed command posts (CPs), concurrent planning and execution, and a robust OPFOR. It focuses on bringing the brigade to a level where they can derive maximum benefit from a CTC rotation. The BBSE was completed in 1998.

As we already know, those products delivered prior to 1998 are outdated, since Army doctrine changed in the 1997/1998.
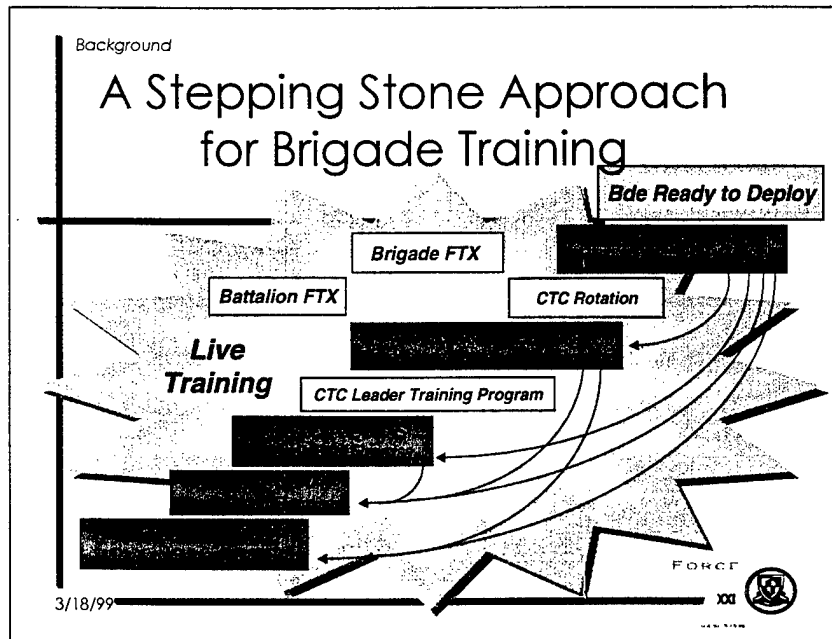
This slide shows the stepping stone approach to using the force XXI-TP products.

It doesn't require every unit to start from the bottom, it just shows a user where the products fit into a training model. In fact several versions of this slide have been developed and in some you will see arrows going from one step to another showing that a unit can use the products at any time, depending on their specific needs.

The products complement live training, such as field training exercises (FTXs) and rotations to the Combat Training Centers (CTCs). They are not designed as single-implementation exercises, but as tools that can be used repeatedly to enhance skill retention over time between live training exercises, to counter the effects of personnel turbulence, and to reinforce lessons learned in live training exercises.

Feedback from the Force

- ◆ **Good Concept ... Needs to be *Fielded***

    ... Must remain viable

- ◆ **Some Dated Material ... *Updates* required**

- ◆ **Very Complex ... Need help/*Support***

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Feedback from the field is that the products are useful, but they must be updated as doctrine and TTP changes.

They also have a lot of material associated with them and are considered somewhat complex. As a result, they are much more likely to be used if, when delivered to the forces, some type of train-the-trainer team assists in the implementation of the products.

....needs to be fielded -- unit leaders that saw the displays during previous Armor Conferences

....must remain viable -- COL (P) Dyer, DGC (M), Ft. Riley

....dated material -- LTC Niedringhaus, 7ATC; & COL Jones, 16th CAV

....very complex -- trial units and supporting BSCs

Issues

FIELD	UPDATE	SUSTAIN
* Educate	* Concurrent	* Ongoing
* Deliver	w/Fielding	* Adapt
* Implement	* Ongoing	

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Focus on the three needs that underlie the strategy.

Fielding - As we stated earlier, we can't just *deliver* the products to the force. We need to *field* them. Fielding entails three components, education, delivery, and implementation. If we don't include all three in our fielding strategy, we'll run into problems when the units try to use the products.

Updating - This is needed because we've changed our doctrine since some of the products were delivered to DTDD, and we've changed how we think about and use technology. Naturally, these need to be updated. The issue here is do we update first and then deliver or do we deliver what we have now, knowing that parts of the products are outdated and tell the field that we'll get them revised products later. Either way, our decision must be part of the education process of fielding.

Sustaining - If these products are going to remain VIABLE, as COL Dyer stated, me must have a plan to update them as our doctrine and TTP changes. This will be an ongoing challenge. The products must also be adaptable to unit needs
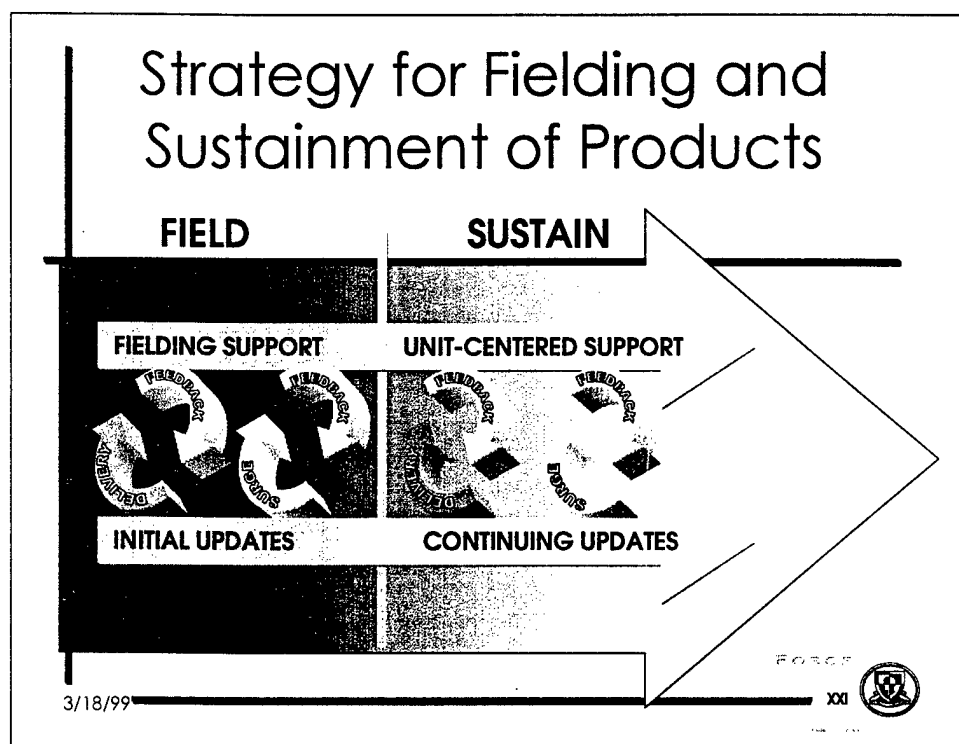
This slide depicts our strategy. We'll use this picture as we describe each part of the strategy.

As shown, initial fielding gradually transitions to ongoing sustainment. Similarly, initial updates are succeeded by a process of continuing updates. Feedback and lessons learned during fielding are used to make the initial updates, which are then delivered and incorporated into the already fielded products. This process continues over time: Units use the products and provide suggestions or concerns, and developers use the information to make continual improvements. Although solutions for each part of the process can be planned and executed separately, all three needs must be addressed in order for any solution to be effective.
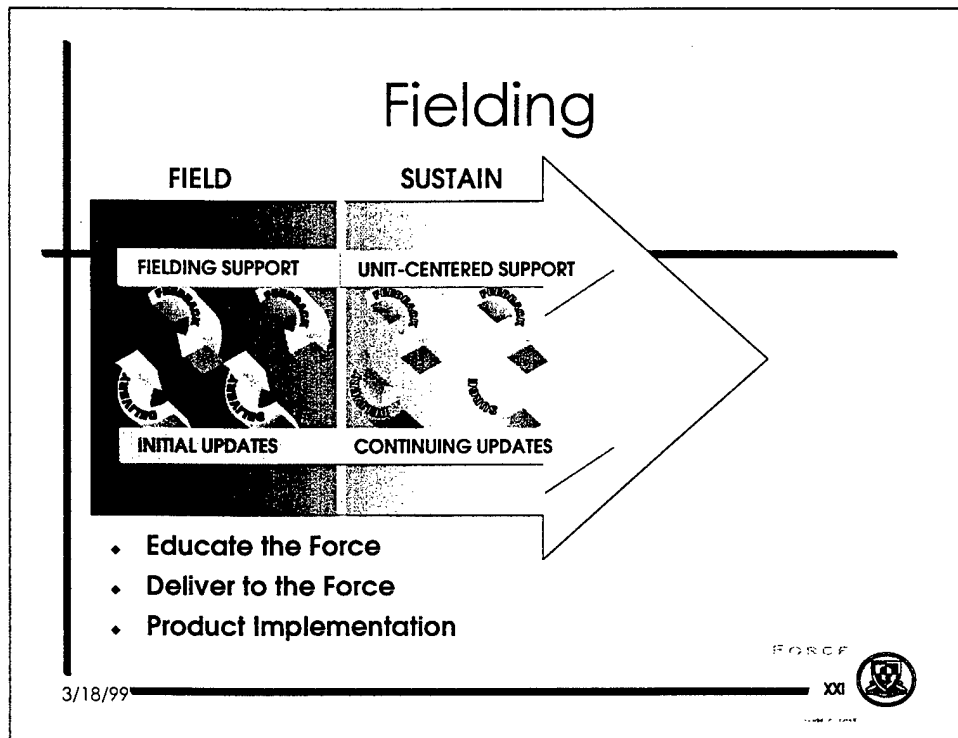
Fielding has three components: *education, delivery and implementation.*

Educate the Force

- **How:**
  - Initial Orientation (Conference)
  - Targeted Briefings (On-site)
  - Implementation Support (On-site)
- **To Whom:**
  - Installation Leadership
  - Simulation Centers

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First we have to develop a plan for educating the users of the products.

Our recommendation starts with a large conference, like the armor conference, the conference is then followed targeted briefings to people who use the products and those who may only reference the products.

   - A typical user would be an AC/RC brigade or someone like a TSB that is supporting an AC/RC use of the product

   - There are several other units/agencies in the force that may never use the product, but need to know about the product in order to make recommendations to user units. The CTC's, BCTP program, and PCC are examples.

The last part of the education process involves the on-site train-the-trainer type education that must occur at the using unit site once they receive the materials.

The plan for educating the force has to include the audience of the products. First we have to explain the program and the products to the senior leaders on the installations. But we also have to train the people running the simulation centers since they are the key implementers of two of the products.

Educate the Force

- ◆ **Initial Orientation**
  - ◆ Briefing (DTDD)
    - ◆ Concept, Products, Strategy
      - – Delivery Plan
      - – Implementation Support Plan
  - ◆ Product Seminars (DTDD & Contractor)
    - ◆ BSTS
    - ◆ Small Group Exercises (SGE)
    - ◆ BSE/BBSE
      - – Exercise Preparation   - Exercise Control
      - – Performance Objectives   - Simulation Support

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We envision the initial orientation conference to have two components:

 - The first component is an initial briefing, given by DTDD or USAARMC, that describes the program and the products and explains how we're going to get these products to the force.

 - The second component is a series of seminars similar to the briefings we provided LTC Niedringhaus from 7ATC. We think that one seminar will suffice for the BSTS and Small Group exercise, but we may need to break the BSE/BBSE workshop down into these four categories.

In all, the initial orientation consists of a briefing and six seminars. We envision the conference attendees will attend whichever workshops they feel are applicable to them, thus most would attend the BSTS and SGE seminar, but perhaps only the BSC folks would attend the simulation support seminar for the BSE/BBSE.

Educate the Force

- **Targeted Briefings**
  - Combat Training Centers
  - CAC
  - TRADOC Schools
    - PCC
    - Staff Training Courses
    - Advance Courses

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The second part of educating the force is targeted briefings.

Here the original conference briefing would be modified, tailoring the briefing to the audience and what we expect their role to be in the training strategy.

Educate the Force

◆ **Implementation Support**
   ◆ **On-site Train-the-Trainer Sessions**
      ◆ BSTS & SGE:
         – BSTS: Users & Administrators
         – SGE: Training & Support Coordinators
      ◆ BSE/BBSE:
         – Exercise Preparation
         – EXCON & OPFOR
         – Simulation Support & Workstation Training
         – Observers
         – Training Audience

3/18/99
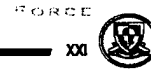
The last part of the education plan for fielding is implementation support.

Feedback form the field says that the using units need this level of training in order to fully understand how and when (and even why) to use the products. This training might include:

   - How each product is intended to be used

   - How each product can be modified and some of the pitfalls that can result if you aren't thorough. But to be thorough, you must first understand each product/component and its relationship to the other products and components.

Deliver to the Force

- **How?**
  - BSTS - ATSC/Internet
  - SGE - ATSC/Internet
  - BSE/BBSE - ATSC/Internet
- **To Whom?**
  - AC and RC Units
  - TSBs / Exercise Divisions
  - Installation Simulation Centers
  - TRADOC Schools

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The second part of the fielding strategy is the delivery.

The strategy in this area mostly deals with *Who* gets what products. By "who" we're referring to the type units listed on this slide.

One other question might be *When*?

Our assessment is that we need to get the current products out NOW with a promise to update the problem areas and deliver the updates as they are made. That's why the fielding plan is important.

BSTS Implementation

- ◆ **Deliver to:**
  - ◆ AC and RC Brigades
  - ◆ TSBs/Exercise Divisions
  - ◆ Selected Advance Courses
- ◆ **Targeted Briefings:**
  - ◆ CTCs
  - ◆ PCC
  - ◆ Selected Advance Courses

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The recommendation for delivery of the BSTS products is more than a broadcast of materials. While some institutional and unit trainers would get the actual materials, other groups would get information in a targeted briefing.

The advanced courses we recommend sending BSTS to are AOAC and IOAC. However, applicable BSTS courses could also be sent to the FA, ENG, ADA, CHEM, and Signal Officer advanced courses.

In many cases, course administrators,just get a briefing to let participants know what they may see when they go to their next unit.

Another consideration, not shown on this slide, is to give BSTS to the officer basic courses or BNCOC.

Small Group Exercise Implementation

- **Deliver to:**
  - AC and RC Brigades
  - TSBs/Exercise Divisions
  - Staff Training Courses
- **Educate only:**
  - CTCs
  - PCC
  - Selected Advance Courses

3/18/99 XXI

The recommendations for fielding SGE is similar to the plan for BSTS.

The only difference **might** be that the advanced courses other than AOAC and IOAC would be less likely to want these than they would want the BSTS.

BSE/BBSE Implementation

- **Deliver to:**
  - Installation / BSC
  - TSBs/Exercise Divisions
  - Staff Training Courses
- **Educate only:**
  - AC and RC Brigades
  - PCC
  - CTCs
  - Selected Advance Courses

FORCE XXI

3/18/99

The plan for implementing the BSE and BBSE is somewhat different. Note that instead of being delivered to the AC and RC Brigades, they would be delivered to the installations and their BSCs. This is because the installation and Division staffs have a large role in supporting this level of training.

In the same manner, we still have to tailor a briefing for the AC and RC brigades, so they understand what these exercises can do for them.

Update Current Products

FIELD   SUSTAIN

FIELDING SUPPORT   UNIT-CENTERED SUPPORT

INITIAL UPDATES   CONTINUING UPDATES

- Purpose
- Production and Delivery Plan
- Effort Required
- Team Requirements

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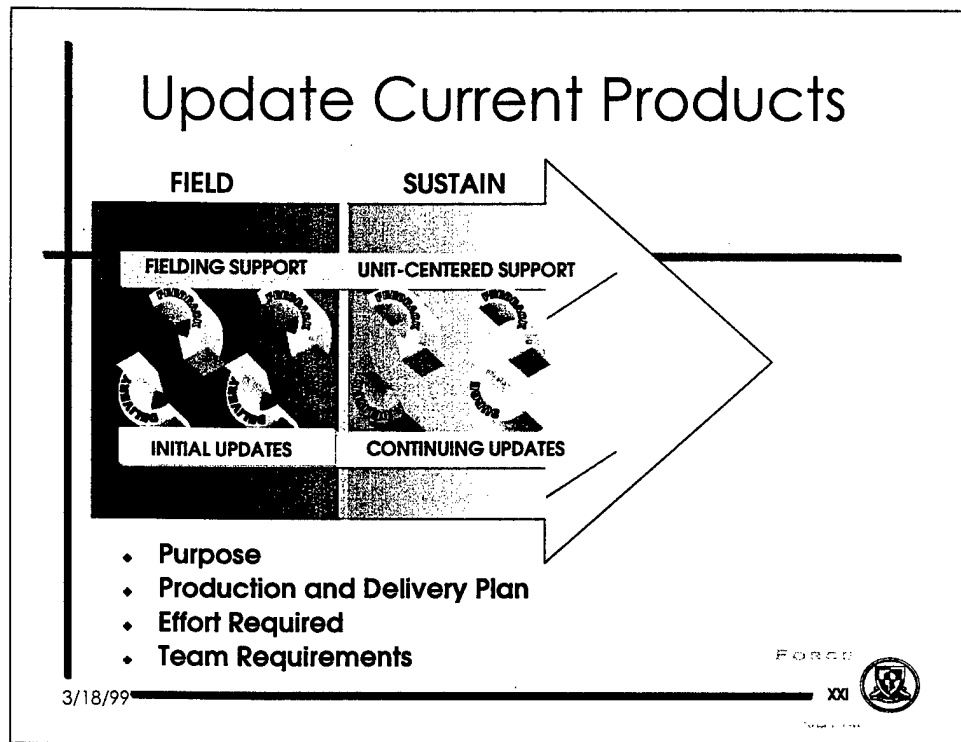
Even though we assert that fielding can and should be ongoing right now, we all recognize that some of the products need to be updated. The question is when and how to deliver the updated product.

The strategy includes starting ASAP with incremental deliveries. The plan for doing this includes the following considerations:

-Purpose

-Production and Delivery

-Effort required

-Update team requirements

D-18

Need for Updates

- **Align with current Army Operations**
  - Doctrine on planning and tactics
  - Operational equipment and weapon systems
  - Division, Brigade, Battalion organizations
  - Link to doctrinal task analytic information (ASAT)
- **Take advantage of technology**
  - Internet capabilities
  - New simulation and simulation upgrades
  - Y2K compliant software
- **Incorporate instructional design advances**
  - Format for adult learners
  - Engineer with human factors considerations

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XXI

The need for the updates is essentially three fold.

First, there have been doctrinal changes in the area of Army Operations since the products were first developed. The changes affect broad areas of planning and tactical procedures, equipment, organizations, and task analytic information.

Technological changes are occurring rapidly. The Internet and simulations offer new capabilities that should be incorporated into our training approach. At the same time, we need to go back into some of the products to ensure Y2K compatibility.

Finally, we are learning more about instructional design, human factors in computer-based instruction, and adult learning models. We need to take these into consideration as we plan for updating the products.

Product Update Requirements

- **BSTS:**
  - Y2K compliant courseware
  - Incorporate human factors in COMPS
  - Incorporate new doctrine
  - Make Internet-downloadable
- **SGE, BSE, BBSE**
  - Incorporate new doctrine in tactical products
  - Incorporate simulation changes into support materials
  - Standardize formats and support materials

3/18/99

BSTS is most affected by the Y2K problem, in the training management system. Human factors considerations (usually lumped under the term "user friendly") need attention. The changes in doctrine must be incorporated. Finally, the delivery mode could and should transfer to Internet-downloadable soon, in order to make the BSTS more accessible to a wide range of users.

For SGE, BSE, and BBSE, we need to examine the impact of doctrinal changes and simulation changes, and look at the TSP design with an eye toward increased user-friendliness.

BSTS Updating:
Production & Delivery

- **BSTS**
  - **Production:**
    - Update courses in pairs (Bde/Bn)
    - Priority is Common Core
    - Bde/Bn staff officer courses
  - **Delivery:**
    - Deliver as updated
    - Replace IAW fielding strategy (educate, deliver, implement)

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3/18/99   XXI

The plan for updating the BSTS courses is to update them in pairs, starting with the Bde and Bn common core courses followed the staff specific courses. Cdr, XO, S1, etc

Common core is the priority, even though it is already the most current course, because it is also the baseline course. The staff specific sources should assume that the person completing this method of instruction has already taken the common core course.

An important consideration of this plan is the requirement to deliver each updated BSTS course as it is completed. We also recommend delivering the new course in the same manner as the delivery of the original course.

SGE Updating:
Production & Delivery

- **Small Group Exercises**
  - Production:
    - Group by OPORD
    - Prioritize updates within OPORD group
    - Simulation-supported last
  - Delivery:
    - Deliver as updated
    - Replace IAW fielding strategy (educate, deliver, implement)

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For the Staff Group Exercises, the updating plan would be to consider the exercises in orders groups.

There are basically4-6 different OPORDs that support the 24 SGEs. By updating them in their orders groups, we can economize on the effort needed to be put into tactical products and scenario development.

Once we have grouped the SGE by OPORDs, we then prioritize the update of the SGEs within the group. Depending on the size of the OPORD group and the amount of change that is required, it is possible that all of the SGEs in a group will be revised concurrently.

The four simulation-supported SGEs should be updated last, due to their complexity and support requirements.

Similar to the plan for the BSTS courses, the SGE should be delivered to the force as they are updated and in the same manner that the original SGEs were delivered.

BSE and BBSE Updating: Production & Delivery

- **BSE/BBSE:**
  - **Production:**
    - BSE by mission
    - BBSE in totality
  - **Delivery:**
    - Deliver BSE as mission updated
    - Deliver BBSE when updated
    - Replace IAW fielding strategy (educate, deliver, implement)

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The BSE should be updated and delivered by mission (there are three missions). This is possible because of the design of the BSE, which has an alternative entry point at the start of planning for each mission and does not require the staff to conduct concurrent planning.

The BBSE on the other hand, must be updated and delivered in totality, because of the concurrent planning requirements that are part of the exercise.

Again, the delivery should be done in the same manner as the original delivery plan for these exercises.

BSTS Updating Effort

	Calendar Weeks	Staff Weeks
◆ Front end analysis	6	45
◆ Common Core Courses	12-16	90-120
◆ Bde and Bn Staff Officer Courses (13 pairs)	117	260
◆ Total Effort, with efficiencies in concurrent work	68-72	395-425 $\cong$ 8 PSY

FORCE

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This slide shows our estimated time it will take to update all of the BSTS courses.

The front end analysis includes: determining what content changes, what the TMS requirements will be, and what the user interface will be. Our guess is that we'll want to change all of these to some extent.

The update time for the courses assumes that we'll change the user interface for each course. The total BSTS could be overhauled in less than 1-1/2 years by an 8-person team, if they're focused on this one task.

SGE Updating Effort

	Calendar Weeks	Staff Weeks
• Front end analysis	4	30
• 20 exercises without simulation	20	150
• 4 exercises with simulation	10	75
• Total Effort, with efficiencies in concurrent work	26	255 $\cong 5 \, PSY$

3/18/99   xx

For SGE, the effort again starts with a front end analysis to determine the extent of the change required. With the front-end analysis information, the estimate is for approximately 1 week per SGE.

The total effort in staff years is about 5 years; the work could be accomplished in 6 months be a team of 10 people, if they aren't also doing the BSTS at the same time!

BSE/BBSE Updating Effort

	Calendar Weeks	Staff Weeks
◆ BSE:	22	176
◆ Front end analysis - 4 weeks		
◆ 1st mission -10 weeks		
◆ 2nd & 3rd missions - 4 weeks each		
◆ BBSE:	14	112
◆ Front end analysis - 4 weeks		
◆ 3 mission package -10 weeks		
◆ Total Effort	36	288
		$\cong 5.5$ PSY

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This slide shows the expected effort for the BSE and BBSE updates. A team of 6 could accomplish the changes in just over a year, if they were not also doing the BSTS or SGE.

Update Team Requirements

- **Familiarity with FXXI-TP Products**
- **Personnel Requirements**
  - Military Experience
    - Brigade and Battalion Command / Staff
    - Doctrinally Current (all BOSs)
  - Training Development Expertise
  - CBI / Simulation Expertise
  - Word-Processing and Graphics Support

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The skills of the personnel assembled to form the update team are critical.

The requirements shown here should not be taken lightly. What is not shown is that the estimates are based on the premise that the team doing this work is knowledgeable about the original products.

One other consideration, is that the update work needs to be coordinated so we don't get updated products that disagree with each other. At the same time, those estimates don't assume time-sharing between product efforts can happen to any great degree.

Support the Force

FIELD | SUSTAIN

FIELDING SUPPORT | UNIT-CENTERED SUPPORT

INITIAL UPDATES | CONTINUING UPDATES

• Ft. Knox
• On-site

FORCE XXI

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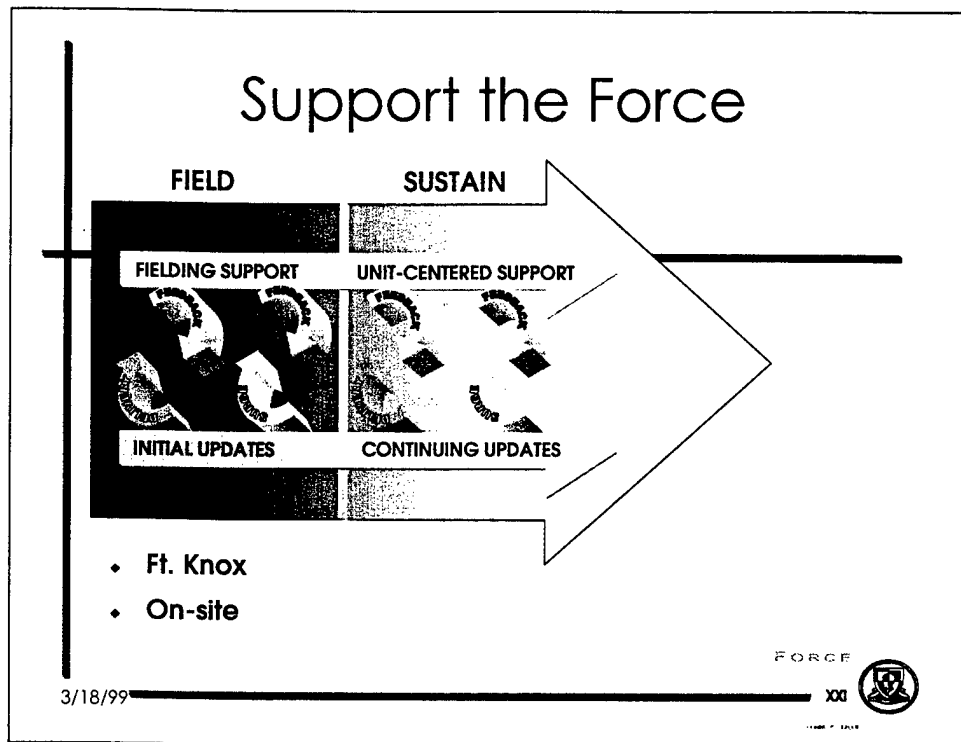
The strategy also address HOW to keep the products viable.

The first solution is to maintain a link to the force. There are two key ways to accomplish that, involving personnel support at Ft. Knox and on-site at the user units' locations.

Support the Force

- **Ft. Knox**
  - Establish a HELP DESK
    - 1-800-TRAINING
    - 24 HOUR ACCESS to the Force (Phone & Internet Access)
    - Menu Driven Options (For COBRAS press 11)
    - Branch School linkage
    - Product Improvement Site (Voice Mail & Internet)
- **On-site (selected locations)**
  - Training Support Coordinator
  - Surge Team support - as needed

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The recommendation for the Fort Knox component has several parts. Most of the efforts could be done efficiently using the manpower already existing within DTDD and its contractors.

The on-site support recommendation is based on data from the ISAT effort, which suggest that the on-site training support coordinator is very valuable to the users. This person can deal with most of the daily problems and would know where to look or who to ask for the bigger problems. If you also look at the SIMITAR and STEP programs for the ARNG, you will also see that these programs included a TSC for each of the supported brigades.

- Why? Because the units have enough problems trying to deal with their daily actions and they can't afford to dedicate a soldier to keep up with these structured programs.

There will be times when a training support coordinator needs assistance as well. One solution is a surge effort where the development/update teams are called to handle a problem, as needed.

Surge Effort Considerations

FIELD   SUSTAIN

FIELDING SUPPORT   UNIT-CENTERED SUPPORT

INITIAL UPDATES   CONTINUING UPDATES
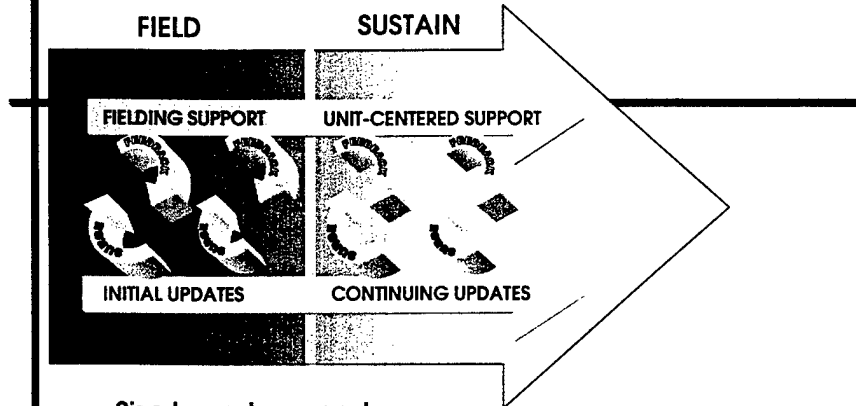
- Size based on needs
- Personnel qualifications

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The level of the surge requirement, would naturally, be dependent on the situation they were asked to support.

What's important here is that to have the right people available when there is a need to surge.

Surge Effort Considerations

- **Size based on needs**
  - FULL SURGE (5-10 people)
  - PARTIAL SURGE (1-4 people)
- **Personnel qualifications**
  - Team Leader - Bde Command Experience
  - Military SMEs - Bde Staff & Bn Command Experience
  - Computer/Simulations Expertise - CBI, Janus, BBS

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The recommendation includes two types of surges.

- Full surges, to support a BSE or BBSE

                and

-Partial surges, to support targeted briefings and train-the-trainer sessions.

The qualifications for surge team members are the same as for the product update teams. Using the same people would insure that the feedback and observations from actual implementations were incorporated into updates, and that the most current updating information was incorporated in implementations.

However, after the initial update work is done, the sustainment effort won't require a full-time staff of 10 people.
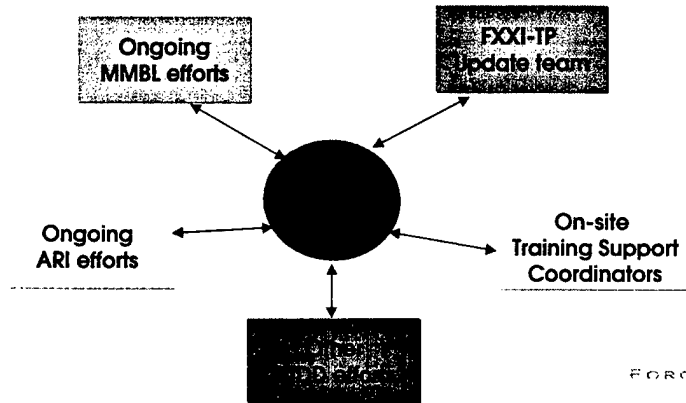
This slide shows at least five ways the people that developed the original and updated work might be brought in from projects they may be working on in the future to assist with a surge requirements.
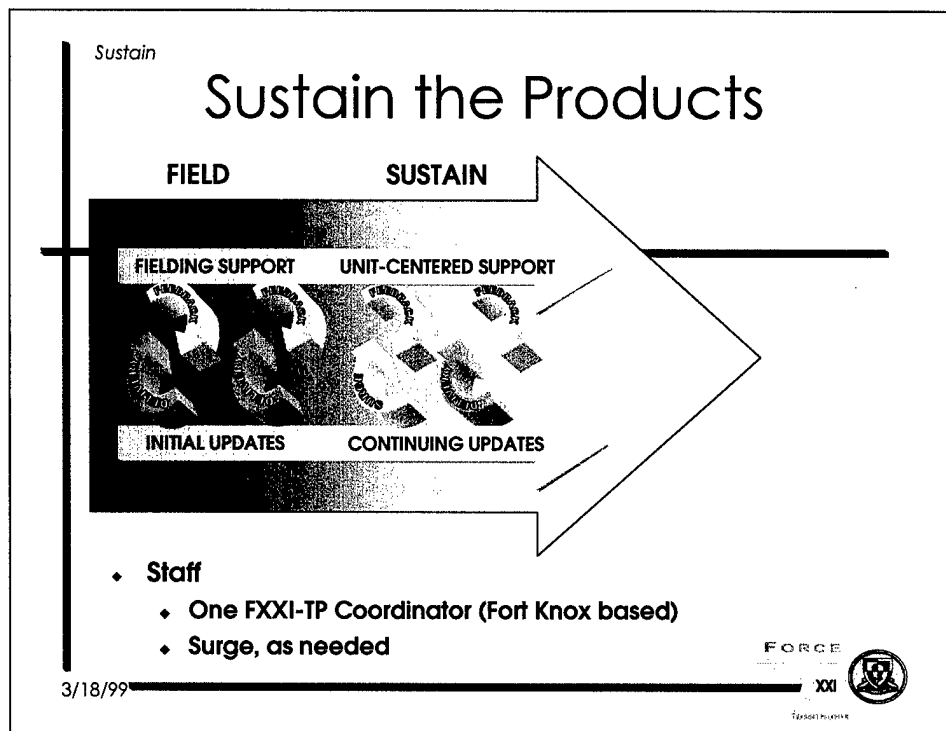
The last part of the strategy is the SUSTAIN piece.

The approach is fairly straightforward: Within DTDD, there should be one person responsible for coordinating the effort. And again, the surge teams are drawn from the Fort Knox based developers as needed to do the sustainment work.

Summary

IMMEDIATE | **ONGOING**

FIELDING SUPPORT | UNIT-CENTERED SUPPORT

INITIAL UPDATES | CONTINUING UPDATES

Force XXI Training Program products need to be --
- **FIELDED**
- **UPDATED**
- **SUSTAINED**

This strategy presents a long-term integrated and multifaceted approach to meeting the needs.

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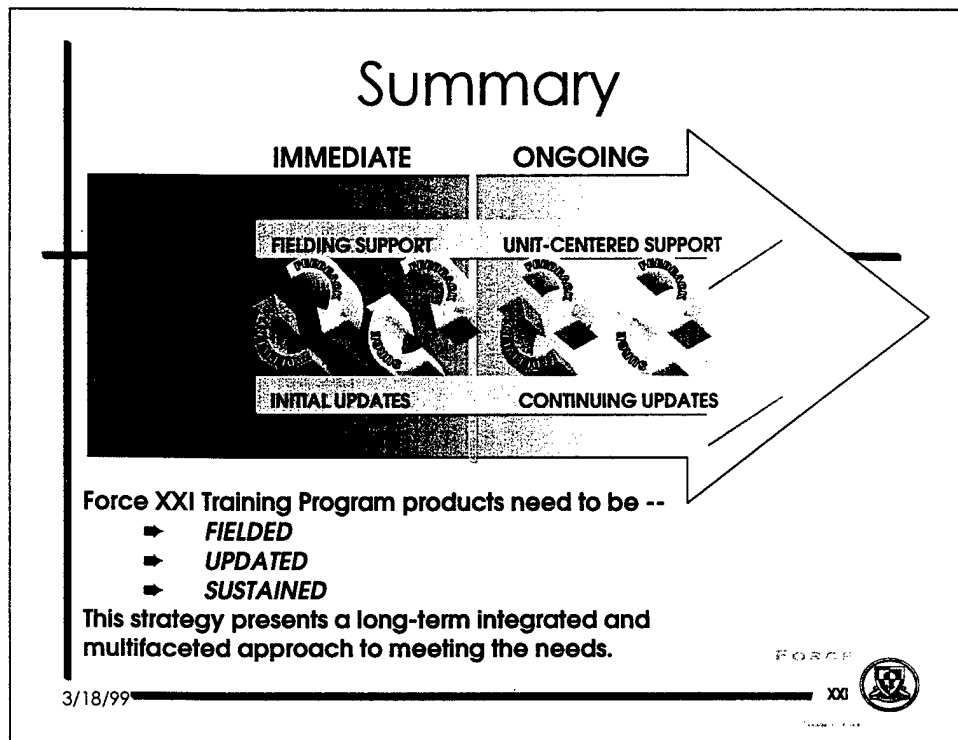
The requirements described above demand an integrated, multifaceted plan that addresses initial fielding support, immediate updates, continuing maintenance, and ongoing sustainment for users. The plan must take into consideration primary users in the AC and RC units, as well as institutional users and supporters. Finally, the plan must ensure that the personnel who will carry out the activities are available, accessible, and of the appropriate levels of expertise and experience with respect to both doctrine and the training products themselves.

Appendix E
An Approach to the Fielding, Maintenance, and
Sustainment of Force XXI Training Program Products

Introduction

Over the past five years, the Force XXI Training Program (FXXITP) has been responsible for the development of a variety of training products for combined arms forces. The training products have been used in a limited number of units, but are not yet widely fielded. Furthermore, no mechanism is in place to ensure that the products are upgraded in response to changes in doctrine, organizations, and equipment.

The Directorate of Training and Doctrine Developments (DTDD) at Fort Knox has articulated a need for an integrated, multifaceted plan for fielding, maintaining, and sustaining selected FXXITP products. The consortium of Human Resources Research Organization (HumRRO), Raytheon, Litton PRC, and TRW-S&ITG has prepared this plan as an outcome of the project entitled *Implementation and Support for Assessment of Force XXI Training Program (ISAT)*. On this project, conducted in 1998-1999 with the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI), researchers assisted with implementation of selected products, and collected data and information pertaining to fielding support, updating requirements, and training effectiveness.

Background

The FXXITP products represent an integrated program of training that provides guidance and practice opportunities for brigades and battalions at levels from individuals to small groups to staff (single echelon and multiechelon), as shown in Figure E-1.

The specific products shown in the figure include:

- The Battle Staff Training System (BSTS) — a series of modules for members of the brigade and battalion staffs that provides individual instruction, practice, and comprehensive testing on staff tasks and processes. The BSTS comprises both computer-based and paper-based materials, and also contains a training management system to track usage. Completed in 1996, the BSTS was partially updated in 1998 to convert one set of materials to completely computer-based mode.

- Staff Group Exercises (SGE) — Twenty-four self-contained vignette exercises for the brigade staff. Each exercise focuses on selected members of the staff reacting to a well-defined problem in a scenario setting. Problems are drawn from such sources as National Training Center (NTC) and other Combat Training Center (CTC) trends analyses and first-hand experience of NTC Observer/Controllers (O/Cs). Twenty of the exercises require no simulation support; the other four use Janus or the Brigade and Below Battle Simulation (BBS). The SGE were completed in 1996, and in 1998 were modified slightly to increase usability.

- The Brigade Staff Exercise (BSE) — A BBS-driven structured exercise for the commander and staff of a combined arms brigade. Three missions are included. The

BSE focuses on staff coordination and use of all assets throughout mission planning, preparation, execution, and consolidation and reorganization. The BSE, which was completed in 1996, provides basic "crawl" level staff practice opportunities.

- The Brigade and Battalion Staff Exercise (BBSE) — A BBS-driven structured exercise for the commander, staff, and one to three battalions of a combined arms brigade. The BBSE incorporates many of the features of a CTC rotation, including 24-hour operations; deployed command posts (CPs), concurrent planning and execution, and a robust OPFOR. It focuses on bringing the brigade to a level where they can derive maximum benefit from a CTC rotation. The BBSE was completed in 1998.

Figure E-1. A stepping stone approach for supporting brigade training with Force XXI Training Program products.

The products complement live training, such as field training exercises (FTXs) and rotations to the CTCs. They are not designed as single-implementation exercises, but as tools that can be used repeatedly to enhance skill retention over time between live training exercises, to counter the effects of personnel turbulence, and to reinforce lessons learned in live training exercises.

The training products were developed by members of the consortium, under contract to ARI. Each of the training products is fully supported by materials for the training audience, trainers, training managers, and simulations managers (as appropriate). However, the completeness of the training packages makes implementation a significant undertaking. Recent investigation of the requirements for implementation suggests that, while the products are exportable, assistance from experienced developers or trainers is critical for deriving full benefits from use of the products.

To date, the various products have been used by brigades and battalions at Fort Hood, Fort Riley, and Fort Lewis, and by a National Guard unit in Kentucky; been reviewed by the 16th Cavalry Squadron at Fort Knox; and are being considered for use by 7ATC U.S. Army Europe (USAREUR). Users and reviewers have been overwhelmingly positive about the utility of the products, and members of those units who have rotated to other jobs are continually in contact with the FXXITP to request materials and implementation assistance.

The ISAT project plans included providing all of the product training support packages (TSPs), a suite of BSTS computers, and an on-site coordinator to support implementation. Research into support requirements and training effectiveness involved intensive observation, documentation, and direct data collection from training participants within two user brigades.

The ISAT work is completed and preliminary analyses of user reactions reveal three common themes:

- The concept is good, and the products need to be made available to units.

- Some of the content is dated—initial updates and continuing maintenance of currency are essential.

- Because of the product complexity, units and installations require support prior to and during implementation.

Problem

The problem confronting the FXXITP is three-fold:

- *Fielding*: The FXXITP products must be made available to combined arms units, including both active component (AC) and reserve component (RC) units. Widespread use of the products in those units depends on support from and education within U.S. Army Training and Doctrine Command (TRADOC) schools, CTCs, and Training Support Brigades (TSBs) and exercise divisions. Information must also be provided to simulations center personnel, who will carry the primary burden for implementation of the simulation-based training.

- *Maintenance*: The training products already require analysis and upgrading in response to recent changes in doctrine, organizations, and equipment. This need is immediate, but such updating will also be required on a continuing basis, to ensure that the products remain current. The maintenance should address not only doctrine, organizations, and equipment, but also instructional and simulation technologies.

- *Sustainment*: For the first year of use, units will require support during implementation. Furthermore, procedures and support for adapting the SGE, BSE, and BBSE to specific unit training needs will help to insure widespread use and maximum training benefit.

Figure E-2 illustrates our understanding of the relationships among the processes. As shown, initial fielding gradually transitions to ongoing sustainment. Similarly, initial updates are succeeded by a process of continuing updates. Feedback and lessons learned during fielding are used to make the initial updates, which are then delivered and incorporated into the already fielded products. This process continues over time: Units use the products and provide suggestions or concerns, and developers use the information to make continual improvements. Although solutions for each part of the process can be planned and executed separately, all three needs must be addressed in order for any solution to be effective.
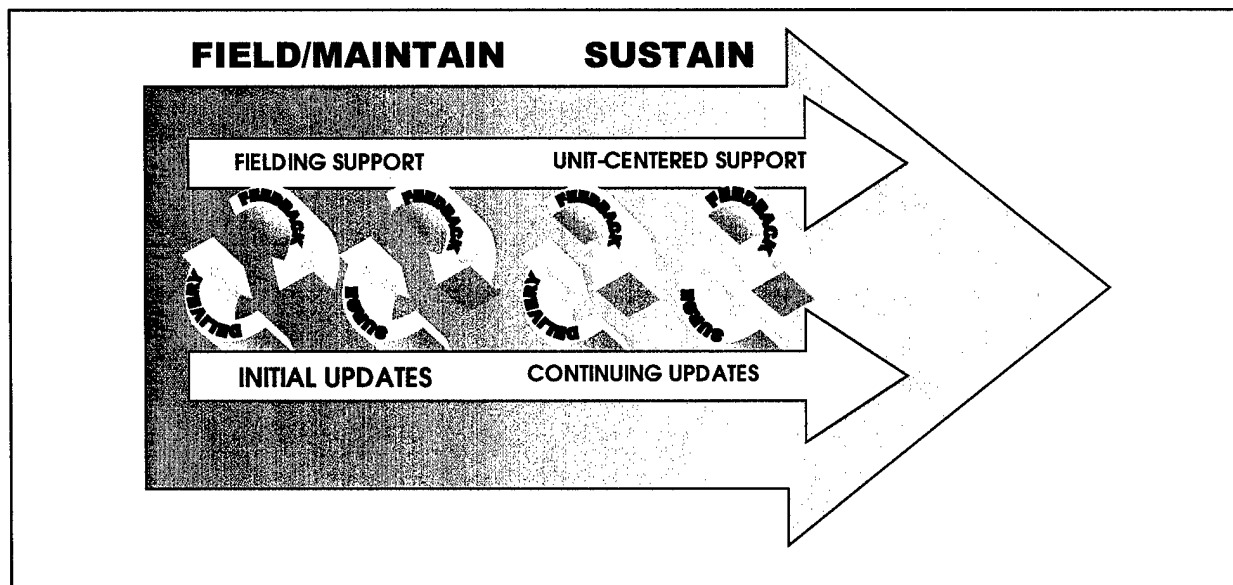
Figure E-2. Integration of fielding, maintenance, and sustainment activities for Force XXI Training Program products.

Plan for Fielding, Maintenance, and Sustainment

This section of the plan includes our approach to all three facets of the problem: fielding, maintenance, and sustainment. It is an integrated, multifaceted plan that relies on experienced training developers to support the fielding and sustainment on an as-needed basis, while also accomplishing the updates to and maintenance of the products. Each of the three facets is addressed separately below, followed by the integrated plan for accomplishing all three requirements with a team organized for efficiency and effectiveness.

Support for Fielding Requirements

As described in the ISAT report, fielding requires support on two levels:

- *Information* for product users, managers, and personnel in related training arenas, and

- *Assistance* for users and managers as part of first-use implementation.

Information Activities

In order for the products to be used, some amount of information is needed. The plan for educating the force has to include the audience for the products, beginning with the senior leaders in the units. But there are others who must also be the subject of targeted education efforts, including:

- Senior leaders of the units' higher headquarters, who will need to support use of the products. Their support includes not only encouragement, but also personnel support during implementation.

- Senior leaders at TRADOC schools, where the products may be implemented in advanced officer and NCO courses.

- Managers of the simulation centers, since they are the key implementers of two of the products.

- Training Support Brigades (TSBs), Regional Training Brigades (RTBs), and exercise divisions who support implementation or recommend use of the products.

- Units and agencies in the force that may never use the product, but need to know about the product in order to make recommendations to user units. These include the CTCs, the Battle Command Training Program (BCTP), and the pre-command course (PCC).

Each of these audiences requires a different level of information. For some, a general information overview that describes the products and their specific niche in the overall training strategy, will be appropriate. These overviews must be repeated with some frequency (e.g., annually) as personnel turnover occurs.

For others, more detailed information must be provided. Information sessions that deliver talk-through/walk-through tours of specific components of the products must be conducted as follow-up to the general overview. These sessions will ensure that individuals with no prior experience with the products will learn enough to make informed decisions about product use.

The last part of the education process involves the on-site education that must occur at the using unit site once they receive the materials. This education must include:

- how the products are related and how use of all products will support the brigade's training strategy,

- how each product and its TSP components are intended to be used,

- what the implementation schedule includes,

- what preparation is required, and

- how each product can be modified and some of the problems that can result from incomplete modifications.

Approach: Information Activities

The approach to the requirement for providing information, as propounded in this plan, involves a series of four types of activities:

- Information briefings
- Information seminars
- Targeted briefings
- On-site seminars.

Information briefings. The first activity, providing a general information overview, takes the form of an information briefing at the Armor Conference, Infantry Conference, and other conferences such as the Association of the U.S. Army (AUSA). The briefings themselves should be presented by the Director of DTDD. Because the information briefings will be open to all attendees at these conferences, a large audience would be expected. However, the targeted group for the briefing will be the senior leaders of installations and units where the products would be used, both AC and RC. Specific invitations should be sent to these individuals, over the signature of the DTDD Director.

Information seminars. An essential follow-on to the information briefing would be focused information seminars to provide more detailed information about each of the products. These seminars should be presented immediately following the information briefing, at the conference sites. Six such seminars are envisioned, covering:

- BSTS components and implementation requirements
- SGE components and implementation requirements
- BSE/BBSE components
    - Exercise Preparation
    - Exercise Control
    - Performance Objectives
    - Simulation Support

As with the information briefings, the seminars would be open to all conference attendees. The target of the seminars would be the individuals who will ultimately be responsible for implementation. Because the seminars are focused, individuals could select one or more that address their own concerns. For example, the RTB personnel will likely be most interested in the seminar on performance objectives, while simulation center managers would be most interested in simulation support.

Targeted briefings. These briefings include both a generic briefing and tailored versions of the information briefing described above. The generic briefing should be updated periodically, and may be used by DTDD whenever there are targets of opportunity for talking about the FXXITP products.

The tailored versions would be used for groups such as CTC personnel, the Combined Arms Center (CAC), leaders of TRADOC schools, PCC groups, and staff training courses (such as Command and General Staff Officer Course, the Combined Arms and Services Staff School, and Armor and Infantry advanced courses for officers and NCOs).

Most of these briefings should be delivered by the Director of DTDD or his designated representative.

On-site seminars. The same seminars that were provided with the information briefings should also be provided, in a reduced form, at implementation sites. On-site seminars will be needed in cases where installation and unit personnel were unable to attend conference briefings and seminars. Because these seminars would be conducted on-site, the specific implementation constraints of the particular unit or simulation center could be addressed in these sessions.

Each on-site seminar should take the form of a train-the-trainer session. The target audience for the BSTS would be unit trainers and those charged with managing the system. For the SGE, the brigade executive officer (XO) and training officer (S3) should participate, and additional training should be provided to the simulation center manager for use of the four simulation-supported exercises.

Both the BSE and the BBSE should be covered in a single series of four seminars. These seminars would be addressed to the brigade and division training managers (S3 and G3) or installation scheduling and resourcing agency for discussions of exercise resources and preparation, exercise control, and training and preparation for the observers and training audience. A separate session could address simulations and workstation training.

First-Use Assistance

Once a decision has been made to implement one of the FXXITP products, more intensive support should be provided. During the weeks leading up to implementation, a wide variety of decisions and activities is required. Early decisions are relatively simple, but decisions and activities that occur immediately prior to implementation are both critical and bewildering for a first-time user. Experience in implementing the products during the ISAT project indicates that the using units need an increasing level of assistance over the weeks leading up to implementation in order to fully understand and utilize the products.

Approach: First Use Assistance

Assistance for first use of the products will occur over a long period of time, and the need for assistance will increase as implementation approaches. In order to address the early questions and concerns efficiently, training support coordinators should be resident at the installations where the products are to be used. The training support coordinators, who should be experienced developers and implementers of the products, will be the first source for the units when they have questions or concerns. These coordinators would be backed up by other developers at Fort Knox who would be primarily engaged in the maintenance activities described

below. Thus, any question or issue that the coordinator was not able to answer could be referred to the larger group of experts.

This expertise would be available to the coordinators by simple means of telephone, e-mail, video-teleconferencing, and via the FXXITP Internet site, which should have a training assistance page. The same expertise and assistance would also be available for users who do not have an on-site coordinator, such as RC units and TRADOC schools.

For the BSTS and SGEs, the on-site support and Fort Knox-based expertise would be sufficient to support use. For the BSE and BBSE, a surge team capability is proposed. The surge team would be formed as needed, comprising 2-6 experts from Fort Knox and spending anywhere from a few days to a few weeks with units prior to and during implementation. Their role will include advising the simulation center manager on matters relating to the scenario files and workstation training; assisting with pre-exercise decisions by the commander, unit preparation, and observer training; and guiding the exercise director, division response cell, and OPFOR controller in conducting the exercise.

Support for Maintenance Requirements

As evidenced by comments from users and reviewers, the FXXITP products are in need of updating. While there is an immediate need, updating should be done on a continuing basis. Additionally, such updating must be done concurrently with the fielding and implementation discussed above.

The process for updating involves two tasks:
- Develop a plan for making and fielding the immediate updates
- Develop a plan for effecting continual maintenance.

The immediate updating plan, the ongoing maintenance plan, and the fielding plan described above should be integrated in order to provide products that the units and schools can use.

Immediate Updating and Fielding

For all of the FXXITP products, the first emphasis for updating should be to align the products with current doctrine, organizations, and equipment. Additionally, advances in instructional technologies and simulation capabilities demand concomitant changes in the way the training is conducted. One very immediate example concerns the year 2000 (Y2K) problem. For all of the technology-driven training products, the technologies themselves must be examined for Y2K readiness, and the products must be modified if necessary to ensure readiness. Other examples include advances in Internet capabilities, upgrades to simulations such as BBS and Janus, introduction of new simulations such as Close Combat Tactical Trainer (CCTT), and even the propensities at particular locations to use only BBS or Janus. It will be crucial to identify the updates that are required immediately, as opposed to those that can wait for a second or third wave of change.

The implementation described earlier should not wait for all of the initial updates to be made. Unit trainers are able to identify deviations from current doctrine and make the necessary adjustments on a short-term basis with the sustainment support described above. However, the immediate updates should be addressed as soon as possible. As the updates are made, they must be incorporated into the already-fielded products in a way that causes minimal disruption.

Approach: Immediate Updates and Fielding

Even as fielding is ongoing, the update team should be actively searching out feedback from units using the materials, for use in planning for and carrying out the most urgently needed updates. Some of the materials within the products are based on 1995 doctrine, organizations, and battlefield systems. Many changes that are needed in these areas are already documented, as a result of work on the ISAT project. The Army's standard graphics systems have changed, rendering parts of the BSTS dated, though not useless. The BSE division organization includes four brigades, each with four battalions—a logical organization for the separate enhanced brigade for which the training was originally planned, but no longer suitable for any existing brigade structures.

Other changes, outside the military, also require that the products be revised. The technologies for computer-based instructional systems are much more complex and powerful than were the technologies of the mid-90s. The simulations that drive the BSE and BBSE have been updated since the exercises were developed, and the materials need to be examined and modified to be usable on those simulations. Delivery of training support package materials has always depended heavily on print mode, although recently CD-ROMs have been used. However, as Internet capabilities continue to expand, the use of internet-downloadable and internet-interactive training should be explored.

A team that comprises FXXITP product developers, with a thorough understanding of the FXXITP products, their components, changes to military doctrine and systems, and implementation concerns and constraints, should be formed to support the updating. Stationed at Fort Knox, they would be responsible for the updates and trials of the updates, while also being available to form up the surge teams for initial implementation support. The initial assessment of the immediate changes required to the products, as detailed in the ISAT report, results in the approach presented here for each of the four products.

Battle Staff Training System. For the BSTS, updating should focus first on the common core modules at both brigade and battalion levels. These modules are a part of the training for all members of the staff, and therefore have the widest applicability. Priority should go next to the brigade and battalion commanders' course and the courses for the primary staff (XO, S1, S2, S3, S4, and FSO) at both levels. The remaining courses should then also be updated. Throughout the process, the courses at brigade and battalion level should be paired for examination and modification.

Initial changes to the BSTS should focus on four areas: Y2K compliance, doctrinal currency, 100% computer-based, and fielded via the Internet. Because current computer systems are not yet advanced enough to make Internet-interactive training feasible, the first complete set

of updated materials would instead be Internet-downloadable. The updated materials would be loaded on the Internet and made available to users as they are developed, without waiting for completion of the update process across all courses.

At the same time, exploration of technologies that may make full internet-interactive courses possible should continue, and efficient ways to allow for distribution of overlays in BSTS should be identified. Finally, a training management strategy must be developed that will allow users to record their successful completion of courses, provide training managers with up-to-date information about staff use of the BSTS, and ensure smooth transitions from the currently fielded materials to the updated materials.

The updating cannot be done in a vacuum. Two important sources of information should be the training developers and doctrine developers within DTDD, and the Automated Systems Approach to Training (ASAT). The databases within ASAT contain a wealth of information about task analysis, and it will be important to link the BSTS training objectives to the task information provided in ASAT.

Staff Group Exercises. The immediate need for the SGE is to verify the currency and applicability of the materials. The SGE materials were originally developed in two efforts. The first 12 exercises were designed to address the training needs of 11 selected members of the brigade staff, and like the BSE were developed with the separate enhanced brigade structure in mind. The remaining 12 exercises expanded the training audience to 16 members of the staff, and were based on a more typical division and brigade organization. Therefore, the first area for review will be the appropriateness of the SGE with respect to the unit organization. Another pressing need is to reexamine the original 12 exercises, to see which should be expanded in order to provide additional training to the expanded training audience.

The individual exercises should be updated in orders groups. Across the 24 exercises, there are between four and seven identical or nearly identical division orders that underlie the tactical situations. The exercises should be grouped by OPORDs, and then the update of the SGEs within the group must be prioritized. Depending on the size of the OPORD group and the amount of change that is required, it is possible that all of the exercises in a group will be revised concurrently. The four simulation-supported exercises should be tackled last, due to the complexity of these exercises and their support requirements.

Other aspects of SGE updating should mirror the considerations stated above for the BSTS. The ASAT will be used for doctrinal information and task referents, and it will be necessary to ensure that revised SGE materials can be loaded into the ASAT TSP library. As with the BSTS courses, the SGE should be delivered to the force as they are updated. Internet-downloadable delivery will be used, and an efficient means for providing the overlays must also be identified.

Brigade Staff Exercise. The BSE is due for a serious overhaul. Already it is known that the division and brigade organizations are atypical, the language and guidance surrounding the military decision-making process are out-of-date, and widely used equipment, such as the All Source Analysis System (ASAS), are not included in exercise conditions. Additionally, the linkage between BSE and ASAT task databases has not yet been definitively delineated.

Update and delivery of the BSE should be accomplished by mission. This will be possible because of the BSE design structure, which provides discrete entry points for each mission and does not require the staff to conduct concurrent planning. As a result, the three missions are separable, and fielding of updated materials can be done as each mission is completed.

Brigade and Battalion Staff Exercise. Because it is the most recently completed of the FXXITP products, the BBSE is also the most current. Nonetheless, the underlying assumptions should be examined in light of current doctrine, organization, and equipment. The BBSE should be updated as a single unit, because the three mission segments are not separable.

On-Going Maintenance

Assuring currency is, of course, a losing proposition. The training products will always lag doctrinal and technology advances. The goal must be to minimize the lag, while ensuring smooth introduction of the changes into training products that are in widespread use. This will require judgements concerning the urgency of the changes, decisions on how often and by what means the changes should be communicated to the users, and evaluation of the efficacy of the procedures.

Approach: On-Going Maintenance

As the fielding and implementation support described earlier are ongoing, the Fort Knox-based update team should be amassing observation, feedback, and lessons learned concerning the products and their use. This information will be needed to determine the needs for additional maintenance to the products. There are a number of needs that have already been identified by the ISAT team, as described below.

One such need for BSTS and SGE is to implement the training in a distributed Internet-interactive mode. The technology will soon be adequate to support such training, although the supporting hardware and software may not be widely available to users yet. When the time is right, the modified delivery system should allow the FXXITP to move away from printed instructions for SGE to more user-friendly methods. The reading burden within SGE is not excessive: The training coordinator can read and understand the administrative instructions and guidance in about an hour, on paper or on a computer display screen. However, the task for the training audience of comprehending the tactical situation and conditions can be complex. Other ways of conveying the information to the training coordinator and the training audience should be considered.

A related need concerns the amount of printed material required for BSE and BBSE implementation. Currently, all of the TSPs for these exercises are provided as printed material. Research should continue on ways to reduce the reading burden while still providing all of the necessary information.

During the course of the past five years, there have been developments in instructional theory and practice that do not involve technologies. Just within the FXXITP work, developers have learned about the learning styles of military audiences, the optimal organization of training

support materials, and the types of guidance, supporting information, and job aids that should be included. The BBSE incorporates some of the innovative ways of conducting training, in the form of performance objectives that include techniques and procedures. The BSE should be further updated to implement BBSE lessons learned in the materials.

Other maintenance needs for the products are the result of changes within the Army. The introduction of digital systems and organizations requires production of TSPs that incorporate those capabilities. Already DTDD and ARI have monitored development of a plan for converting the products. Other terrain areas should also be incorporated into modified exercises. Simulations are frequently upgraded, and the products should be modified in order to make them still usable. Products that are currently implemented within one simulation should be converted to versions using simulations available at other locations.

Support for Sustainment Requirements

Experience on the ISAT project indicates that, once implementation has occurred for a unit, the assistance needed for subsequent implementations is markedly reduced. The level of assistance needed will vary across the training products. An integrated plan is needed that will ensure that the needed support is available for units and institutions as they continue to use the products. This focus on unit-centered training is at the core of the sustainment need.

Unit-Centered Training Support

The need for sustainment will vary for the products. The BSTS is used continually, so that the experience gained concerning implementing and managing the training is constantly reinforced. Similarly, in the case of the SGE, continual unit use will insure continuity of implementation expertise. External support may be required when upgrades are made, and in the event of a software glitch or damaged product materials.

The BSE and BBSE are more likely to require sporadic intensive support. In most cases, the TSPs will reside with the simulation support center, and those personnel will be responsible for managing and assisting with implementation. However, it is expected that the BSE and BBSE will be used less frequently than the BSTS and SGE. Therefore, it will be necessary to plan to provide support for one or more subsequent implementations.

There is another consideration for on-going support of the BSE and BBSE, concerning locally-directed modifications. Over the past three years, every implementation of the exercises has involved some degree of customization. In each case, exercise developers assisted in making the modifications throughout the TSPs in order to ensure the structural integrity of the product. It is anticipated that units will continue to want to impose changes on the exercises prior to implementation. Therefore, it will be very important to have a procedure for providing continuing advice and support for units and simulation support center personnel, probably for the first three or four implementations at a given location.